The Mining Journal

LONDON, JANUARY 3, 1958

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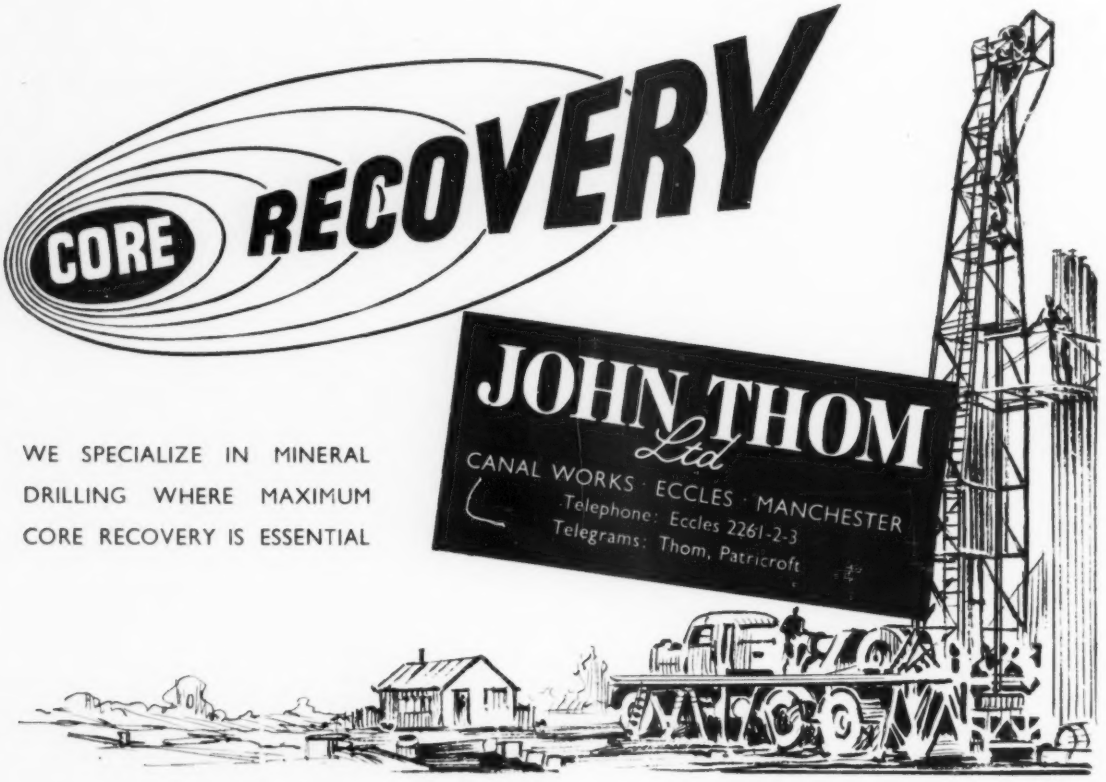

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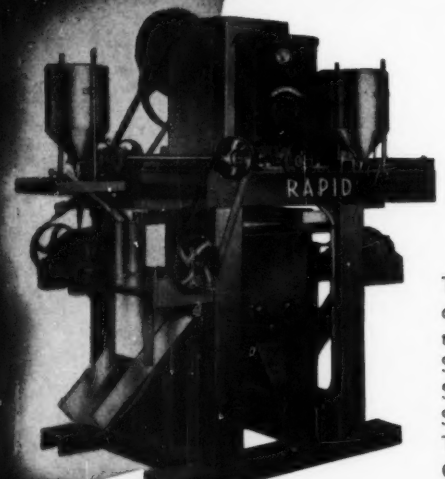

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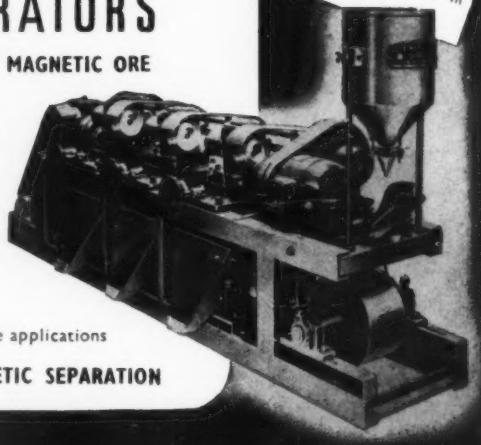

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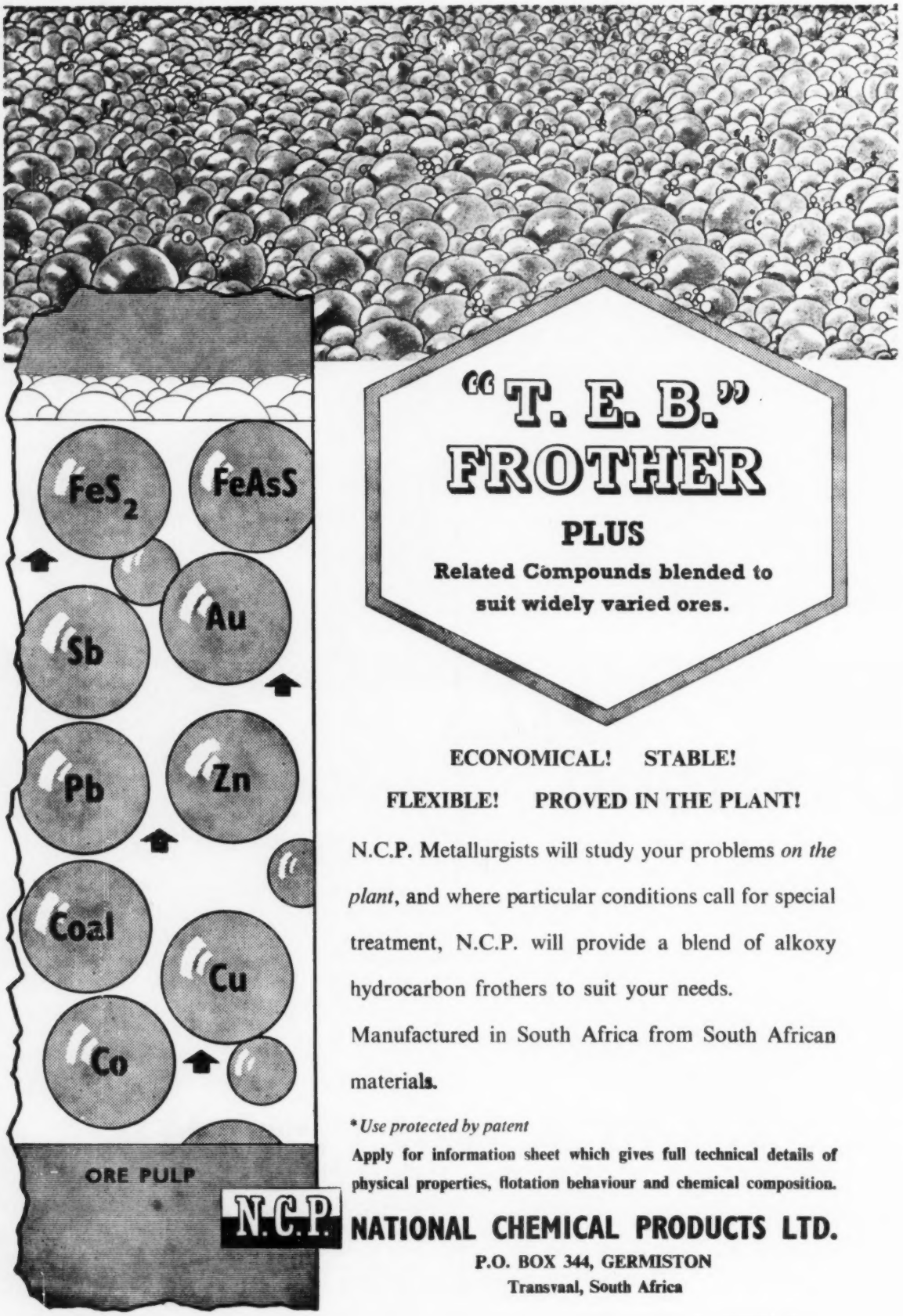

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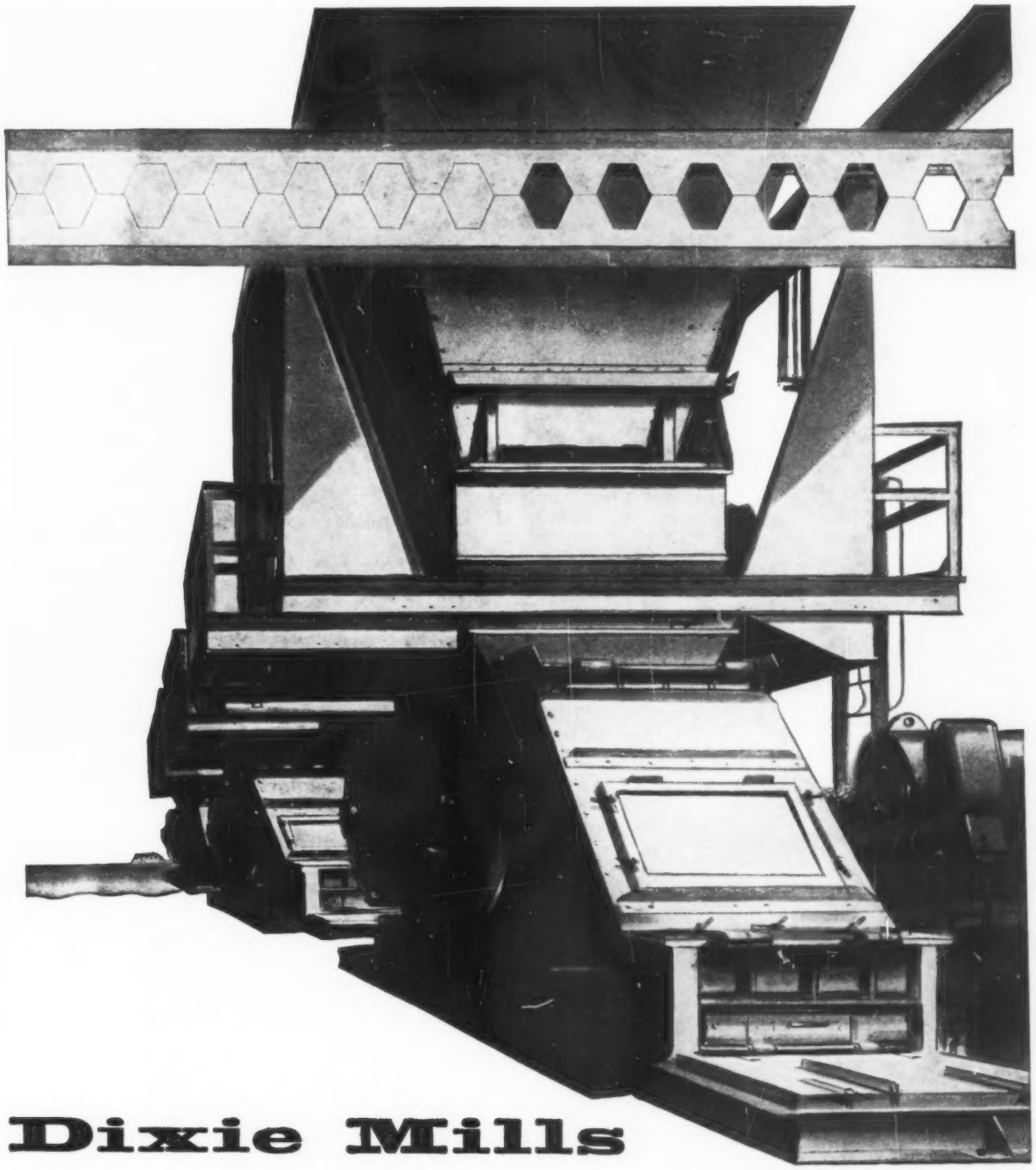

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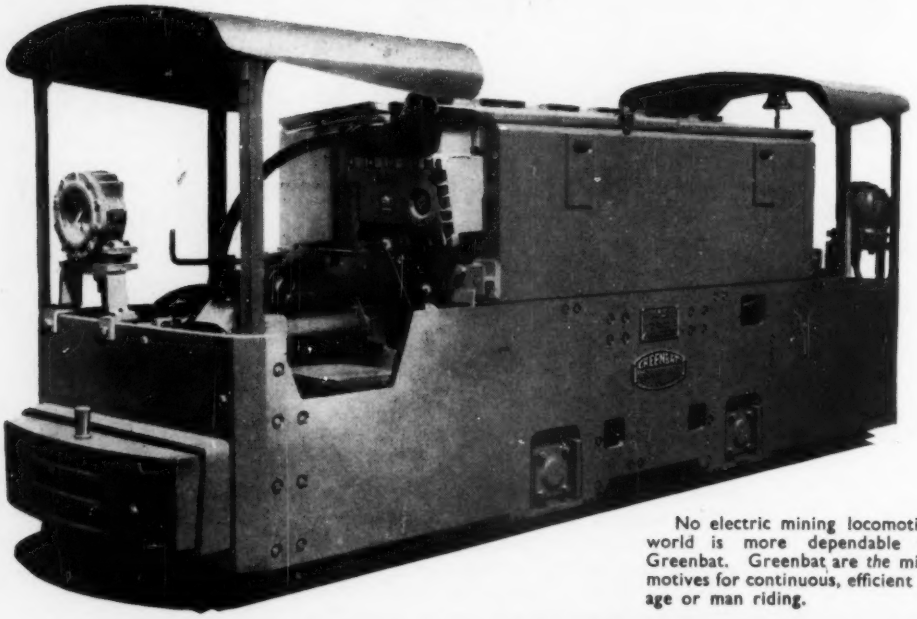

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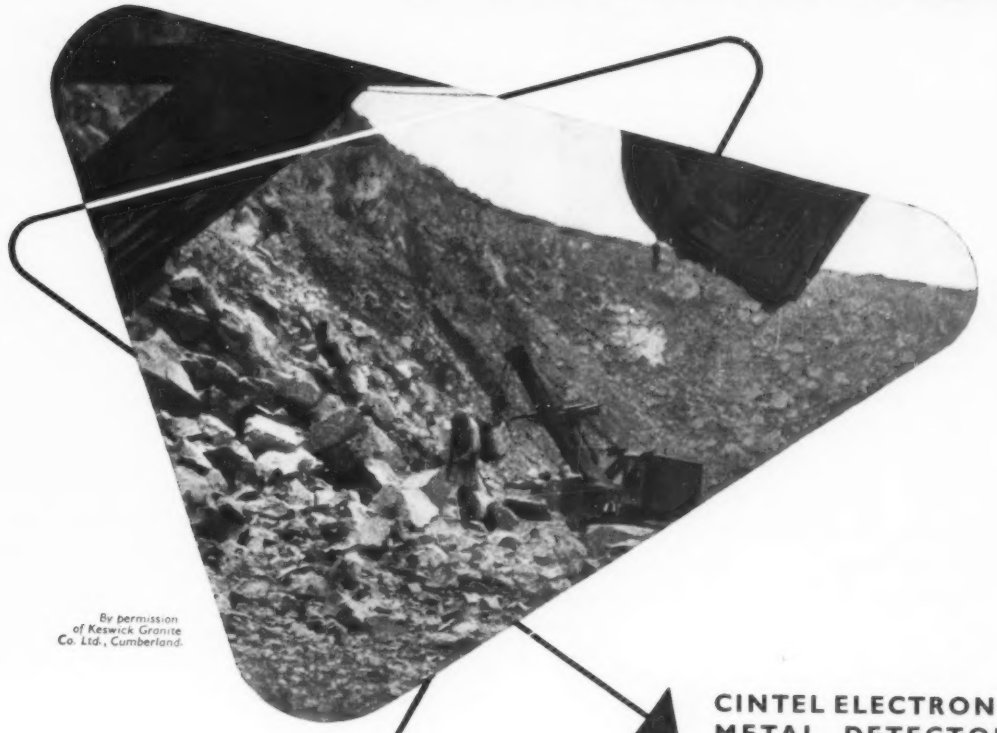

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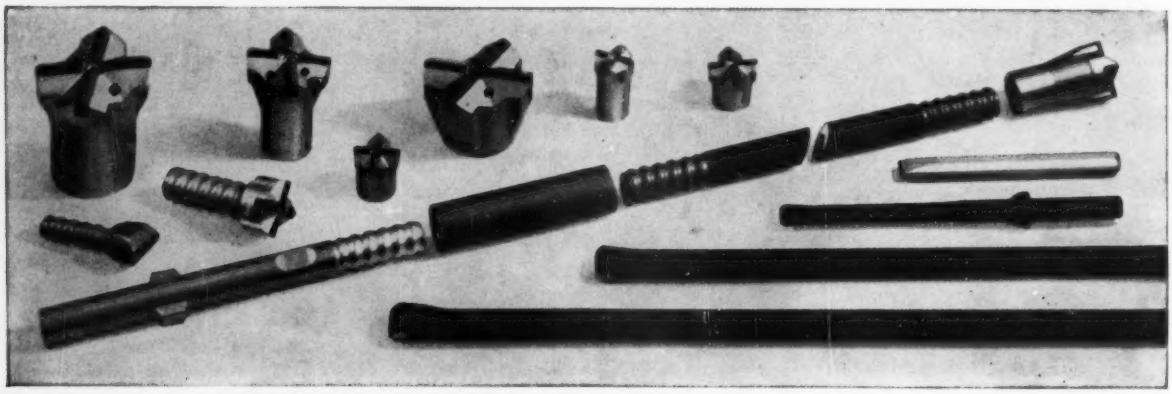

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The Mining Journal

London, January 3, 1958

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Recession, Recovery or Readjustment?

ECONOMICALLY the year 1958 opens with more than the usual uncertainty as to what the short-term future has in store. The largest single factor governing the progress of mining and industry in the Free World is the tempo of activity in the United States, where the Ship of State is at present at the mercy of so many currents, cross-currents and tempests that its course cannot with confidence be charted by the most expert navigators. All that can be stated with certainty is that the much talked of recession does, in fact, exist. The question is whether it is destined to be short and mild or whether 1958 will witness a " chain reaction " set up by rising unemployment, reduced personal incomes and dwindling exports, which will lead to further cutbacks in both business and consumer spending.

The economic prophets may be divided broadly into two opposing schools of thought. There now appears to be a general concensus of opinion that a further decline in business will take place during the first half of the year. One school of thought, which includes both government economists and leading industrialists, believes that later in the year production will resume its upward trend, due to such factors as higher government spending, an aggressively easy money policy, increased home building and buying, and a revival of consumer demand stimulated by easy credit terms. On the whole, those who believe that the corner will soon be turned seem confident that, on balance, 1958 will compare not unfavourably with its predecessor.

No less distinguished economists are to be found on the other side of the fence, among those who hold that the U.S. Government's corrective measures may not be sufficient to avert a severe and prolonged reaction from the long sustained post-war boom. Maintaining that the vulnerability of the economy has been increased by the great accumulation of both durable goods and debts during the past ten years, the pessimists foresee a danger that the recession might last for two or three years rather than the six months more commonly anticipated.

Even quite a mild recession in the United States could cause substantial damage to the rest of the Free World. Unfortunately, as the Economic Commission for Europe has pointed out in its latest bulletin, a U.S. depression at the present time would find the world in a less favourable position to resist its cumulative effects than in 1953-54. At that time adequate reserves provided a cushion against the effects of the decline in U.S. activity on exports from primary producing countries, thus preventing the start of interdependent and cumulative downward spirals. The advent of 1958 finds deficit countries more vulnerable to speculative movement of capital, while the persistently weak foreign exchange position of a number of economically important countries has dampened the drive for economic expansion.

The recent recovery of sterling, though due essentially to a return flow of speculative money, is also a reflection of an improvement in the U.K.'s own balance of payments following the resumption of normal oil revenues, lower freight rates and an improvement

in the terms of trade. As E.C.E. points out, however, lower prices for imported commodities must eventually result in a fall in the purchasing power of overseas primary producers, including those in the rest of the sterling area.

In attempting to assess the short-term future one cannot ignore the possibility that declining consumer and business expenditure, coupled with falling exports and aggravated by import restrictions imposed in the interests of dwindling dollar and gold reserves, might result in further declines in the level of stock prices, and that the downward spiral might be still further accentuated by industrial strife arising from growing employer resistance to wage demands.

A major and lasting recession, coming at a period when the young nations of Africa and the East were clamouring for loans and grants to help finance their programmes of economic advancement, would be a major disaster for the non-Communist world. For this reason, if for no other, we believe that it will not be allowed to happen.

Despite present difficulties the Free World economy still remains at a high level and the underlying factors making for expansion—growing population and rising living standards—remain as strong as ever. What is mainly required to keep the wheels of world industry turning at sustained or even accelerating speed is restoration of confidence, which the U.S. Administration has in its power to achieve by wise economic leadership and by further large-scale injections of capital into the developing territories.

The spectacular success of the Russian sputnik programme is in itself a bull point for 1958, since it appears to have considerably reduced the likelihood of any curtailment in Uncle Sam's expenditure during the current year, whether on defence or foreign aid.

BRIGHTER HORIZONS FOR NEW ZEALAND MINING

The fortunes of New Zealand's mining industry are chronicled by the Mines Department, whose annual statements have latterly painted a picture of almost unrelieved gloom.

A further decline in gold and silver mining is recorded in the department's latest report, which covers the calendar year 1956. Production of bullion during that year amounted to 27,013 oz., valued at £323,086, the gold content of the bullion being estimated at 26,063 oz. and the silver content at 950 oz. Gold production showed a decline of 380 oz. from the 1955 production and compares with an output of 75,115 oz. in 1951. Of the total 1956 production, gold from quartz mines accounted for 68 oz., from dredges for 25,234 oz., and from alluvial deposits for 761 oz. The small production of gold from quartz was won by two parties engaged on cleaning-up operations round the treatment plant of the old Martha Mine.

During 1956 four dredges were in operation, three on the West Coast and one near Alexandra. The Taramakau dredge, which was formerly the Kaniere dredge, started operations on May 14, 1956, in the Big Hohonu River, a tributary of the Taramakau River. The Snowy River dredge ceased dredging on March 1, 1957, so there are now only three dredges in New Zealand winning gold.

The report makes no mention of prospecting operations for gold, which presumably are no longer being undertaken.

In other sections of the mining industry both production and prospects appear to be rather more encouraging than in previous years. During 1956, 2,627,716 tons of coal were mined in the Dominion, compared with 2,556,653 tons in 1955—an increase of 71,063 tons. The 1956 output was, in fact, the highest since 1952, thus giving the lie to any belief that "coal is finished" in New Zealand as a source of heat and power. Further increases can be expected from 1958 onwards when the Mercer Steam Station comes into operation. The quantity of coal mined in the Waikato continues to increase. In the Buller district production shows a heartening rise, due mainly to the increased application of hydro-mining. With the improved supply of labour, the production of coal in the Grey Valley has recovered to the level of 1954. As against these increases, coal production in the Kamo field declined by 49,000 tons, due entirely to the closing of the State Mine.

In 1956, the pumping capacity at the Kamo Colliery was augmented substantially to try and dewater the mine sufficiently to ascertain whether coal from the West Drive area could be mined economically. It was found that the pumping capacity would have to be increased considerably more to win the coal under safe conditions. This rules out all possibility of mining coal economically. No workable coal was disclosed by an extensive boring programme undertaken by the Department in the vicinity of Kamo.

Production of coal from opencast mines during 1956 amounted to 796,990 tons. It is expected that opencast mining will provide an increasing percentage of the coal won in the Dominion. Steady progress is being made with the development of the opencast mine at Maramarua, which will produce about two-thirds of the coal to be consumed at the Mercer Power Station. While the number of men employed at opencast mines has been declining since the peak year of 1949, production of coal per man has reached 2,490 tons—the highest yet recorded.

There was little activity in base-metal mining during 1956, but production of industrial minerals was well maintained. The only development of any significance was the location of uranium ores in bedded deposits in the Hawk Crag breccia on the north side of the Buller Gorge. The Extent of the occurrence of uranium minerals in Hawk Crag breccia has been widened by their discovery at the mouth of the Fox River about 30 miles south of Westport. Radioactive anomalies in the highly-leached beds of this breccia outcrop are considered to warrant further investigation, but it will be necessary to carry out intensive prospecting in this area to ascertain the extent of uranium present.

Professor G. J. Williams, Dean of the Otago School of Mines and Metallurgy, recently expressed the opinion that production of at least 750 tons a year, worth between £4,000,000 and £5,000,000 yearly, should be envisaged when the Buller Gorge uranium deposits are exploited.

There has also been growing interest in the projected establishment of an ironsand industry in New Zealand, proposals for which are to be placed before the Dominion's Cabinet as soon as possible.

YUGOSLAVIA'S MAJDANPEK PROJECT

A short time ago the construction of the Majdanpek project was started in Yugoslavia. The project includes development of a copper mine and building of a flotation plant at Majdanpek, a new copper smelting plant and a sulphuric acid factory at Bor, a superphosphate factory at Prahovo on the Danube as well as a number of subsidiary plants on which the production in the new large integrated copper plant will depend. About 40 billion dinars ($=300 dinars) will be spent on these operations, including equip-

ment to be imported computed at the official rate of exchange. The future development of Yugoslav copper industry is largely dependent on the completion of the Majdanpek project.

The new mine and flotation plant at Majdanpek, located in the andesite formations of east Serbian mountains, are planned to process about 3,600,000 tons of copper ore annually which will yield approximately 127,000 tonnes concentrate to be processed in the Bor smelting works into 25,000 tonnes of blister copper. Domestic copper production will thus amount to about 55,000 tonnes annually since about 30,000 tons are obtained from the copper ore produced at Bor. Thus Yugoslavia will again rank among the ten largest copper producers in the world.

The opencut copper ore deposits at Majdanpek amount to about 183,000,000 tonnes, from which about 1,500,000 tonnes of copper can be obtained. The Majdanpek ore contains 0.8 per cent of copper and is considerably poorer than the Bor ore. However, favourable excavation conditions make exploitation very economical. The ore reserves so far estimated in the Majdanpek surroundings will enable the mine to operate for at least 25 to 30 years.

The new Bor smelting works will be equipped with installations for the collection of sulphuric gases which were wasted in the past and which will be used as raw material in a new sulphuric acid factory having an annual capacity of 230,000 tons.

The acid will be shipped in truck-tank to Prahovo on the Danube where a superphosphate factory with a capacity of 575,000 tons annually will be built. In addition to sulphuric acid from Bor, the Prahovo factory will use imported raw phosphates.

With the completion of the Bor and Majdanpek projects the needs of the copper processing industry will be fully satisfied. Since the aggregate electrolytic and blister copper requirements of Yugoslavia total about 42,000 tons and Bor and Majdanpek will produce 55,000 tons, it is estimated that, after completion of the Majdanpek project, Yugoslavia will be able to export certain quantities of electrolytic copper.

BECHUANALAND'S SEARCH FOR MINERALS

Only a limited amount of work was done on direct mineral survey in the Bechuanaland Protectorate during 1956, according to the annual report of the Geological Survey Department for that year. Drilling was continued in the investigation of the potential coalfields in the Palapye and Artesia-Debeeti areas. A total of 5,412 ft. was completed in 18 boreholes drilled in the Bamangwato and Bakgatla Reserves. The areas investigated were the Morapule basin west of Palapye, the Debeeti-Mamabula area, the district north and west of Artesia, and the Dugwe quarantine camp area in the northern Protectorate.

In March, preliminary geological studies were undertaken at the Bushman Mine in the northern Bamangwato Reserve. In collaboration with the Department, The Geological Survey of the Union of South Africa carried out a regional gravimetric and magnetic survey of the Protectorate during June and July. The geological survey of the Territory is still in its early phases, and until larger areas of the country have been geologically surveyed, the discovery of potentially interesting areas must of necessity be delayed. At the present stage of the development of the Geological Survey, emphasis has been placed on the acquisition of geological knowledge.

The main work of the Survey during the year was concentrated on hydrogeological survey. Nevertheless, there has been continued interest in the country's potential mineral resources. The headquarters at Lobatsi were visited in this connection by a number of consulting geologists representing prominent mining houses, and enquiries were received in connection with the grant of rights to prospect for copper, nickel, coal, salt, manganese and diamonds. No finality was reached, however, in the granting of prospecting rights in any area. It is of interest to note that a brief summary of mineral ownership is included in the Report, owing to this increased interest in Bechuanaland's mineral potential, and in view of the uncertainty expressed regarding mineral ownership and the acquisition of prospecting rights.

In so far as general minerals exploration is concerned, analyses at the Bushman Mine show that the high soil Ph (up to 9.2) restricts copper dispersion very considerably, but a reasonable anomaly was obtained in the southernmost grid on the extension of the mineralized zone. An anomalous zone was also traced some 2,000 ft. south east of the main working, but further pitting and sampling will be necessary to decide whether or not this anomaly is due in large part to contamination. Further studies are planned for this area.

Continued interest was displayed in the Magogaphate nickel-copper occurrence in the north eastern Bamangwato Reserve, and as in previous years, the Survey continued to give advice on the geological problems existing at the Moshaneng asbestos mine. Asbestos output from this source was some 20,000 tons below the previous year's production figure, a shortfall attributed largely to lack of labour.

Reconnaissance geological mapping continued throughout the year.

SWAN SONG FOR MALAYAN COAL

A warning has been given in the annual report of Malayan Collieries Ltd. that the colliery at Batu Arang may be forced to close down in the not too distant future. The chairman, Mr. J. Drysdale, C.B.E., reports the failure of his personal approach to ministers of the Federation of Malaya Government and of the separate representations to government of the Malayan Trade Union Congress, in an attempt to obtain assurances of continued support to keep the mines operating and so assuring the continuance of employment for the miners.

The report states "unfortunately, the government does not seem to be interested in the coal mining industry". During the past year the railway's demand has dropped from 1,000 tons a month to nil, in consequence of the turnover to diesel and oil-fired locomotives. The Central Electricity Board has also reduced its requirements by 2,500 tons a month. The current demand is averaging around 10,700 tons a month, and any further fall will mean at least a further restriction of operations.

The company relies entirely on local demand as the coal is of low grade, very friable and subject to spontaneous combustion. It is therefore unsuitable for export or bunkers. Maximum production in any year was 781,509 tons in 1940. The post-war highest was 415,777 tons in 1950, since when the annual figure has declined to 182,477 tons in 1956, and 123,407 tons in the first nine months of 1957.

The only other coal deposit in Malaya to have been commercially exploited was at Enggor in Perak, which was worked out in 1928.

Explosives in Canadian Mining

IN step with the growing and diversified requirements of the Canadian mining industry, a complete range of high-explosives is available. It includes the ammonia dynamites, straight gelatines, ammonia gelatines and semi-gelatines. Blasting agents are also supplied.

The quarry grades, " Nitrone " and " Nitrox ", for use in large diameter holes in open-pit mining operations and quarries, introduce new standards of safety to open-pit mining operations, being very insensitive to shock and friction. " Nitrone " primers and " Nitrox " contain T.N.T. in their formulation and are classified as high-explosives for rail shipment, whereas " Nitrone " is classified as nitro-carbo-nitrate and thus has a lower freight classification.

" Nitrone " T-1 and " Nitrone " T-4 differ mainly in density; i.e., in bulk strength, or in energy per unit length of charge. The former is the denser of the two and is comparable in performance to a 60 per cent gelatine, the T-4 grade being equivalent to a 40 or 50 per cent Dynamex. " Nitrone " is shipped as packed in cans, without any exterior packing case. One end of each can is equipped with a bail to facilitate lowering into the borehole.

" Nitrox " blasting agent was developed to meet special field conditions where greater strength and density are required. Its use, therefore, is principally in the bottom of the holes in hard-breaking formations where difficulty is encountered in pulling the toe. Field experience indicates that it is about equivalent in performance to a 75 or 80 per cent gelatine.

Special primers have been developed for use with blasting agents. The actual priming charge, composed largely of T.N.T., occupies only the middle section of the can. While it can be initiated by a blasting cap or by " Primacord ", it is still very insensitive to shock and friction. The end sections of the can are filled with a special grade of " Nitrone " having excellent priming characteristics.

A blasting agent composed mainly of coarse grained or prilled ammonium nitrate, sensitized with carbonaceous material, has recently been developed. Since it has no inherent water resistance, it is being packed in polythene or multi-wall paper bags. Due to its insensitivity it cannot be detonated by a cap or by " Primacord " but must be fired by means of a " Nitrone " or high-explosive primer.

Brands of safety fuse currently manufactured in Canada are designed to have a burning speed of approximately 120 secs. per yd., at sea level, when tested in the open in 3-ft. lengths, with an allowable variation of 10 per cent either way from standard. All brands possess good water-resisting qualities, will withstand reasonable handling and usage, and produce a minimum amount of smoke when burning.

Hot wire lighters can be ignited by a match and were developed specifically to provide greater safety in blasting operations where safety fuse is used. They are manufactured in 7-in., 9-in. and 12-in. lengths which burn through in approximately 1, 1½ and 2 minutes respectively. Their burning rate may be seriously affected by adverse storage conditions.

Developing Igniter Cords

The chief aim in the development of igniter cords has been to devise a method of splitting fuse whereby the blaster need remain at the face for no longer than the time that is required for the splitting of a single fuse.

Two varieties of " Thermalite " igniter cord are available. Type " A ", with a burning rate of approximately 8 secs. per ft., was developed for normal use in stopes where the blastholes are usually spaced from 2 ft. to 4 ft. apart. Type " B ", which burns at approximately 16 secs. per ft., was designed to meet the conditions encountered in development rounds or other locations where the blastholes are drilled relatively close together. Both types are marked at 1-ft. intervals, making it easy to connect the fuse at the required spacing.

" Thermalite " igniter cord connections are used to provide a means of connecting the igniter cord to the end of the safety fuse. They consist of copper tubes with a composite ignition charge consolidated in the base under pressure, after which a slot is cut into the closed end, leaving just enough metal to provide a hinge. They are the same

size as No. 6 blasting cap and are usually crimped on one end of the cut length of safety fuse by the same crimping machine used to crimp a No. 6 blasting cap on the other end.

The bodies of the electric starters used in Canada consist of a copper shell approximately 0.30 in. in dia. and 2 in. in length. Each end is closed by a crimped rubber plug, the lower one holding a 5-in. length of igniter cord (Type " B ") and the upper one a standard electric blasting cap bridge wire with 1-ft. plastic insulated leg wires. The bridge wire is embedded in a loose ignition charge. Blasting caps are No. 6 strength and of aluminium shell construction.

Electric blasting caps, or E.B. caps as they are commonly called, function instantaneously on the passage of an electric current of sufficient intensity. They are manufactured in two strengths, No. 6 and No. 8, the former being sufficiently strong to initiate all grades of commercial explosives now being supplied in Canada.

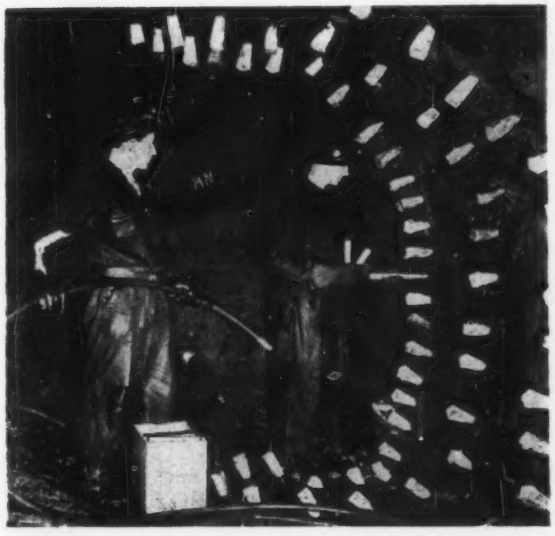
Rotation firing electrically is accomplished by means of delay E.B. caps, which are similar to electric blasting caps except that a delay is inserted between the ignition portion of the cap and the base charge. Two different types of delay E.B. caps are now manufactured in Canada; L.P.V. (long-period ventless) delays and short-period caps.

L.P.V. delays allow for approximately ½ sec. delay between consecutive periods and are manufactured in No. 8 strength only, in 15 periods of delay from Nos. 1 to 15 inclusive. They are supplied with plastic-covered leg wires of distinctive colours. Their main use is in driving drifts, raises and shafts, where rotation firing in delay intervals of approximately ½ sec. is desirable.

Short-period caps, another comparatively recent development, differ from L.P.V. delays in that the firing interval between the various periods is of the order of a few milliseconds only. They are No. 8 strength with plastic-insulated leg wires and are supplied in 22 standard periods, Nos. 0 - 22 inclusive.

The most notable advantages derived from the use of short-period caps are : (a) reduced vibration and concussion; (b) improved fragmentation; (c) more predictable results from the point of view of amount and direction of throw of the blasted material; (d) reduced backbreak and overbreak, with working faces left in an improved condition; (e) fewer cut-off holes, with a consequent reduction in the hazard of unexploded dynamite remaining in the broken material.

Loading drill holes before the blast at International Nickel's Frood-Stobie mine. Photographs are by courtesy of International Nickel Co. of Canada Ltd.



The commercial explosives and accessories available in Canada are reviewed by A. E. Dyment, Sales Manager, Explosives Division, Canadian Industries, Ltd., in *Mining in Canada*, the first volume of a series of books issued in connection with the Sixth Commonwealth Mining and Metallurgical Congress.

The use of a voltohmeter—designed as a combination blasting galvanometer, voltmeter and stray current detector—contributes materially to increased safety in electrical blasting operations by enabling the blaster to test the working place for stray currents before loading. The same instrument can be used to determine the exact voltage of the power source, make all necessary tests on the blasting circuit, and finally to check the lead wires for stray currents immediately before making the final connections.

Blasting Machines

Blasting machines are of two main types—generator and condenser. The generator types contain a small generator activated by a firm twist of a handle or a downward thrust of a rackbar. They develop pulsating d.c. current and are so designed that no power is delivered until the end of the stroke. Machines available include the No. 10 twist and the No. 30 and No. 50 push-down machines. The former is rated at 10 E.B. caps in a single series; the second at 30 caps in a single series, and up to 90 caps when connected in three equally-balanced series; the No. 50 machine at 50 caps in a single series and up to 200 E.B. caps in four equally-balanced series.

Condenser discharge machines are energized by either a hand-operated generator or a series of dry-cell batteries, current from which builds up a high potential in a bank of condensers.

The CD-30 and CD-48 condenser discharge blasting machines are powered by a pack of 90 v. storage batteries. The former model has a rated capacity of 400 electric blasting caps connected in series-in-parallel circuits of 40 caps per series. The CD-48 is capable of firing 1,000 electric blasting caps connected in 25 series of 40 caps each.

The Beethoven Exploder derives its power from a hand-driven a.c. generator and, through a step-up transformer and metal rectifiers, a six-microfarad condenser is charged to a potential of not less than 1,200 v. This exploder is capable of firing 200 electric blasting caps connected in a single series, providing the lead wire resistance is not in excess of 2.5 ohms and current leakage is not a factor.

" Primacord " is a detonating fuse consisting of a high-explosive core of P.E.T.N. contained within a waterproof covering and reinforced with various countering materials. It is characterized by a very high velocity of detonation (20,350 ft. per sec.) and excellent safety features. It is available in three types : plain, reinforced and wirebound.

" B-Line " detonating fuse, a recent Canadian development, has been designed exclusively for use in secondary blasting operations. It is of lighter construction than " Primacord ". Detonating relays enable split-second blasting to be carried out with " Primacord ".

Brazil's Growing

THE geographical division known as North-East Brazil occupies an area of 375,298 sq. miles, more than the combined area of East and West Germany and France. It embraces the States of Maranham, Piaui, Ceara, Rio Grande do Norte, Paraiba, Pernambuco, Alagoas and the Island of Fernando Noronha, a convict settlement off the coast of Pernambuco.

Until recently this region attracted little attention as a source of minerals other than gypsum, dolomite and scheelite. Intensive aerial surveys and ground prospecting during the last six years have revealed the existence of more than twenty varieties, including magnesite, rutile, ilmenite, cassiterite, lepidolite, amblygonite, manganese, fluorite, barytes, diatomite, calcium phosphates and bismuth.

Many deposits await further investigation in order to determine their commercial value, but the official Bank for North-East Brazil reports that the following are being exploited with relative success: columbite-tantalite, bismuth, barytes, amblygonite, manganese, magnesite, fluorite, gypsum and diatomite. Recent shipping lists for Joao Pessoa, capital of Paraiba, illustrate the diversity of mining activities in this region. They include small, but appreciable, quantities of columbite, tantalite, tungsten, fluorite, amianthus, barytes, bismuth, amblygonite and scheelite.

Other Deposits

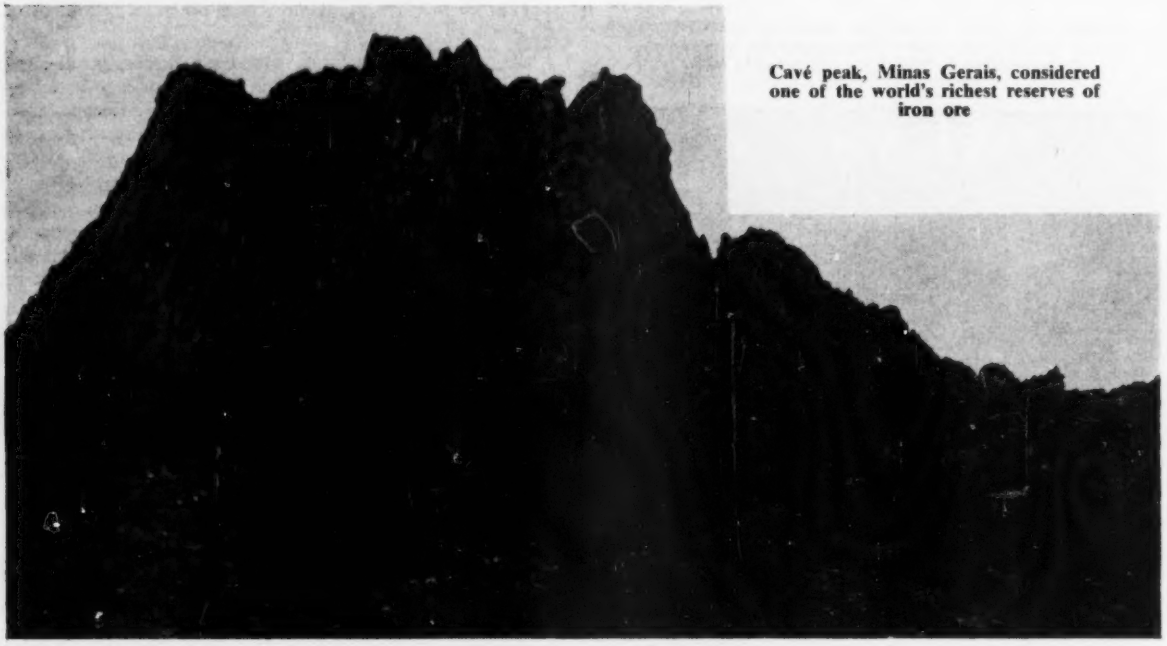
Occurrences of rutile and ilmenite of good quality, in commercial quantities, have been proved in Pernambuco and Ceara; rock crystals in Piaui and alluvial gold in Paraiba and Maranham. Brazil's biggest producers of columbite are the municipalities of Parelhas and Carnauba dos Dantas, in Rio Grande do Norte, while Paraiba is the second most important source of barytes and beryllium. In Natal, French interests have applied to the local authorities for permission to industrialize barytes and other minerals; a Brazilian firm is installing plant to process tantalite and beryllium.

Eight deposits of high-grade magnesite exist in Central Ceara, near Iguatu, with estimated reserves of 200,000,000 to 300,000,000 tons. The magnesite is calcined in primitive kilns and exports reached 8,000 tons annually during the war. Occurrences of bismuth are exploited near Santa Luzia de Sabugi and Borborema and deposits of copper and lead exist in the north-east, but have not yet been investigated.

During the past few years prospecting has revealed the following minerals, among others: amianthus in Pernambuco, Rio Grande do Norte, Alagoas and Ceara; cassiterite at Picui, in Paraiba, and at Sao Jose de Egito, Pernambuco; magnesite in Alagoas; uranium, thorium, tungsten, cassiterite, mica, quartz, tantalite and scheelite in Paraiba, Rio Grande do Norte and Ceara. In 1956 Industrias Quimicas Reunidas, which has been extracting and concentrating monazite on the Rio and Espirito Santo coasts, transferred part of its activities to Sao Rafael, in Rio Grande do Norte, where thorium minerals with a ThO_2 content ranging from 7-11 per cent were discovered in 1955.

The abundant reserves of scheelite in North-East Brazil are being exhaustively examined in view of the growing world demand for tungsten. Several deposits of high-grade mineral, hitherto unsuspected, have been found in Rio Grande do Norte and Paraiba during the past two years. Eight mines are being worked in the first-named State, two in the latter, and output increased from 971 tons in 1955 to 1,434 (estimated) in 1956. The Wah Chang Trading Co., of U.S.A., invested U.S.$5,000,000 last year to extract tungsten from scheelite at Currais Novas, Rio Grande do Norte, and the first consignments of machinery arrived in 1957.

The Department of Mineral Production (DNPM) is aiding the owners of small scheelite deposits to acquire machinery and rationalize work.



Cavé peak, Minas Gerais, considered one of the world's richest reserves of iron ore

In this article, our correspondent in Brazil stresses that more than twenty varieties of minerals have been discovered in north-east Brazil during the last six years after intensive aerial surveying and ground prospecting. Additional remarks on manganese and nickel production emphasize the rapid growth of the minerals industry in the country.

Mineral Industry

The discovery in 1951 of important phosphate beds near Olinda, Pernambuco, gave a new impetus to the Brazilian fertilizer industry. Reserves are estimated at 49,000,000 tons, with a P_2O_5 content ranging from 6 to 22 per cent, and the deposits are easily worked. A consortium has been formed to exploit the mines and produce concentrates of phosphorite on a large scale. The federal government is building a mineral quay at Recife and connecting it by rail to the factory to facilitate distribution.

Apatite occurs in limestone formations in several Brazilian states, including Alagoas and Paraiba. Deposits of phosphoric bauxite exist in Maranham; organic phosphates in Maranham and Trauiras; calcium phosphate, with reserves of over 1,000,000 tons, on Rata Island, Fernando Noronha, and rock phosphate on Itapeçoca Island, off the coast of Pernambuco.

DNPM is investigating the possibility of utilizing the bauxite of the Marcaçuma River in Maranham as fertilizer owing to its high phosphoric content. Reserves are estimated at 10,000,000 tons, with 30-40 per cent aluminium oxide, which is being separated for industrial purposes, and 20 - 30 per cent phosphates. Preliminary tests at government agronomical stations have proved highly satisfactory.

North-East Brazil should eventually become an important supplier to domestic and foreign markets.

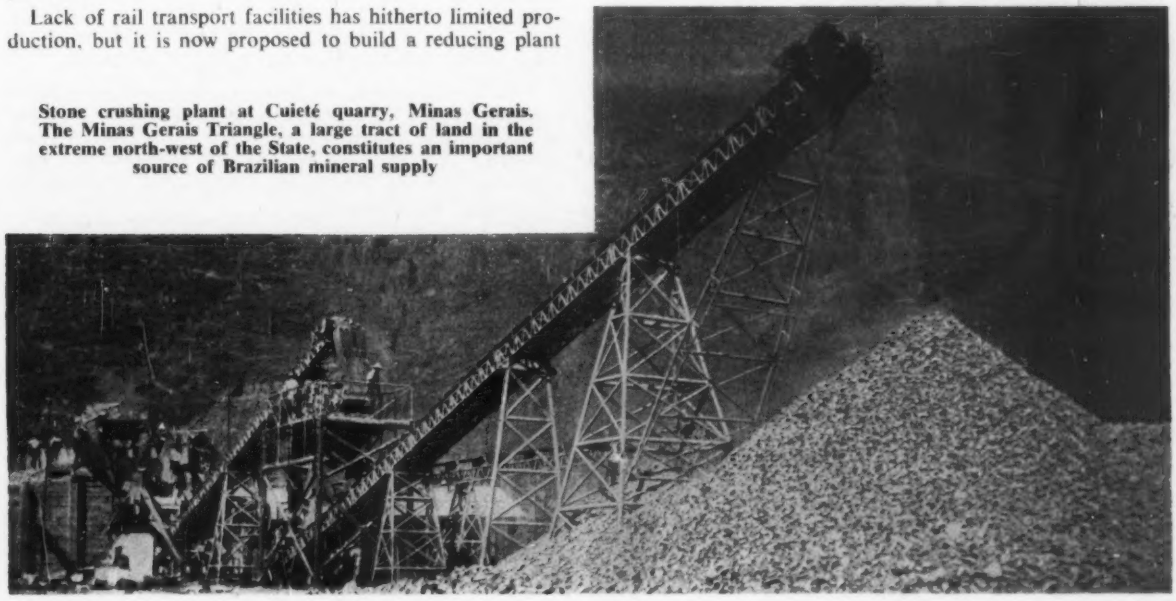
So far as mineral production in the country as a whole is concerned, Brazilian output of nickel, negligible in 1954, increased to 34,600 tons in 1955, namely 600 tons from the Minas Gerais mines, and the remainder from the Niquelandia deposits in Goias, formerly known as Sao Joao de Tocantins, where a Canadian company is operating. The Goias deposits have revealed to date 20,000,000 tons of ore, with an average of 2 per cent metallic nickel. In some mines the nickel content reaches 4 per cent and even 20 per cent.

Lack of rail transport facilities has hitherto limited production, but it is now proposed to build a reducing plant at Niquelandia, where hydraulic potential and other conditions are favourable, and convey concentrates, instead of the ore, to consuming centres and shipping ports. Brasilia, Brazil's new federal capital on the Central Plateau of Goias, will be inaugurated in April, 1960, and is being connected by rail to Goiania, the state capital, to Sao Paulo and Belo Horizonte, in Minas Gerais.

Plant has been installed at the Liberdade mine in Minas Gerais, where the reserves are estimated at 5,000,000 tons, and is treating silicated nickel ores by the electro-metallurgical process. Production averages 2.5 tonnes of ferro-nickel daily, with a 20 per cent Ni content, part of which is being exported to Germany. At Ipanema in the same state, Consortio Metalurgica do Brasil has been organized to exploit the properties of Niquel Brasileiro S.A., with estimated reserves of 6,000,000 tons, and produce metallic nickel, nickel salts and alloys. The plant will work with hydrogen, obtained by electrolysis from water.

Nickel Production

All nickel ores so far discovered in Brazil are silicated and, therefore, more difficult to mine and concentrate than sulphated ores. In addition to the three occurrences referred to above, a small deposit, with over 250,000 tons of 3-4 per cent Ni, is being worked by Cia. Sao Paulo Mineracao at Jacupiranga, in the Ribeira Valley, Sao Paulo; another mine, similar in every respect, is exploited by Cabral S.A. at Bau, in the Liberdade area, Minas Gerais. Other occurrences, awaiting further study, include sixteen in Minas Gerais; two in Goias, at Cavalcante and Vianopolis; one in the State of Rio de Janeiro, at Areal; and two in Bahia, at Campo Formoso and Serra dos Eguas.



Stone crushing plant at Cuieté quarry, Minas Gerais. The Minas Gerais Triangle, a large tract of land in the extreme north-west of the State, constitutes an important source of Brazilian mineral supply

Brazil requires annually some 1,000 tons of nickel and produces 300 tons of ferro-nickel, while imports are in the order of 300 tons yearly. The pyrometallurgical and hydro-metallurgical processes for concentrating silicated ores are costly and cannot be employed economically by the concessionaires of small deposits. A new hydro-electric-metallurgical process, based on the "molecular disorder" of the mineral, followed by lixiviation and electrolysis, has been evolved in Brazil and was successfully tried out in pilot plant, installed by the Department of Mineral Production at Liberdade in 1956. Plant to process one ton of ore daily can be installed at a cost of 500,000 cruzeiros (£2,500) and requires only 6,000 kWh. and 550 man-hours per ton of pure metal produced. The need for costly electrodes and raw materials, high-grade refractories and delicate apparatus is eliminated.

The country's exports of manganese increased in value from the equivalent of $U.S.5,400,000 in 1955 to $U.S.8,300,000 in 1956 and $U.S.14,000,000 in the first half of 1957. Shipments from the mines in the Amapa Territory are expected to reach 700,000 tons this year, as against 275,000 in 1956. The reserves of the three Amapa deposits, Serro do Navio, Espigao do Meio and Espigao do Crumbo, are estimated at over 40,000,000 tons, of which 4,000,000 have been measured to date.

The Minas Gerais reserves contain 5,000,000 tons of exportable manganese, with over 42 per cent Mn, and 10,000,000 tons of low-grade ore. The principal deposits are in the Lafaiete zone, where the National Steelworks (Volta Redonda) has two mines, Agua Preta and Cocuruto, producing an average of 800 and 500 tons monthly. The former is an extension of the Morro da Mina mine, exploited by Meridional, a subsidiary of U.S. Steel Corporation. Other deposits exist in the Sao Joao del Rei, Ouro Preto, Itabirito and Diamantina zones.

The Morro do Urucum deposits near Corumba, Mato Grosso, have estimated reserves of 33,670,000 tons, of which at least 15,000,000 tons have over 43 per cent Mn.

8,000 tons-an-hour Project in Liberia

THE Liberian mining industry will become the scene of much vigorous activity in the near future, when plans for its development begin to be translated into action. These include the opening up of a new 8,000 tons-per-hr. mine at Nimba, necessitating a new 250-mile railway to a site at the coast where a new port will be built. Expansion of the Liberian Mining Co.'s operation is also expected, and the plans here envisage the development of a new quarry in 1959, 20 miles S.W. of Bomi, to be known as Cape Mount. This site will be linked with Bomi by double track and the existing single track to Monrovia will be doubled to deal with an expected output from both quarries of some 7,500,000 tons of high-grade ore per year.

The new venture responsible for opening up the deposits at Nimba is the Liberian American Swedish Minerals Co. This is believed to be a consortium of companies, amongst whom are Grangesbergsbolaget (whose mines in Northern Sweden have recently been nationalized), the Atlas Copco group and a leading Swedish civil engineering company, SENTAB. It is also believed that a U.K. and an American concern are represented.

The company has been actively prospecting in the south-eastern part of the country for some time. At one stage, much interest centred around the prospection of deposits at Putu, although these were later proved of insufficient size to warrant development.

The Nimba Project

The new site, at Nimba, lies 250 miles north of the coast and unconfirmed reports state that the company expects to operate some 30 excavators in the 1½ - 2½ yds. range, besides much ancillary equipment. To date, an extensive drilling programme has been carried out, together with some tunnelling.

It is possible that the mine may be linked by double track to a new terminal at the coast, the proposed site being at Lower Buchanan.

Port facilities to be constructed will include arrangements for the direct discharge of side-tipping wagons into ore carriers. In the early stages a 40-mile road will be constructed from the nearest barging point on the coast in order to bring up supplies and equipment for the port project.

Stone for the new harbour will be won from quarries sited inland, and of interest will be the necessity for providing scrubbers and washers to remove clayey decomposed material from the stone.

Whilst the main quarry at Nimba is being developed together with the connecting rail link, at Bassa some 80 miles inland from the port and on the proposed line to Nimba, exploratory tunnels are being driven on the results of which a decision to quarry iron ore will be made. Atlas Copco pusher drills and Coromant steels are being used.

An indication of the magnitude of this new producer is given by the report that some £25,000,000 is being invested by the consortium. The Liberian Government's stake is credited at a further £25,000,000, the larger part being represented by mineral rights.

The Bomi Hill Operation

At the Liberian Mining Co.'s Bomi Hill operation, opened in 1946, a new Bucyrus Eyrie 150 B dragline will shortly be installed to augment the company's excavating units. Some ten Caterpillar D 8's and 12 D 7 machines are operated here, together with a fleet of 40 Euclids.

Since it was opened, the run of quarry material at Bomi has been fed to a 22-in. Nordberg gyratory crusher, followed by screening to eliminate fines which carry the low-grade material. A high-grade product for shipment has been achieved, with the production, however, of a substantial stockpile of low-grade ore.

In order to deal with this stockpile a treatment plant will be erected and this, together with ore from the new quarry proposed 20 miles to the S.W., will raise production from its present level of 2,500,000 tons per annum to over 7,500,000 tons in 1959.

Other activities in Liberia include some work by the Krupps organization, although there is no indication yet of the extent to which they are interested in workable deposits of iron ore.

Rutile deposits along the coast have been examined by Colombia Southern and these, if proved, may be similar to those under examination in the bordering territory, Sierra Leone, where the prospection has been reduced to a care and maintenance basis pending developments in titanium metal.

Land Rehabilitation in Malaya

ONE of the problems which has beset large-scale alluvial mining throughout the world has been the rehabilitation of mined-out land.

Our correspondent in Malaya points out that this problem becomes particularly acute in tropical countries which suffer from erosion caused by exceptionally heavy rainfalls. Of course, mining is not the only cause of devastated land areas, agriculture can be an even worse offender, especially on hilly ground. However, it cannot be denied that the disturbance of soil by mining does reduce its vegetative productivity and renders it more liable to erosion than undisturbed areas.

A visitor to Malaya taking an aeroplane trip from Penang to Kuala Lumpur and looking down upon the world-famous tin-producing Kinta Valley and seeing the scars of mining there, may form an entirely erroneous conception of the magnitude of the problem in Malaya. He will be flying over an area from which is won three-fourths of Malaya's total production of tin concentrates. Without seeing the rest of the country he will be unable to realize that less than one per cent of the country's surface is alienated for alluvial tin mining. He will also most probably be unaware that large areas of the land he is looking at were once mosquito-breeding swamps, now converted by the tin dredges into healthy but bare dry sand flats, which at least form a basis for useful development.

The problem of utilization of old tin-tailing areas has been considered by authorities for many years. In 1951, following representations by the Forestry Department of the Federation of Malaya, a grant was made from the Colonial Development and Welfare Funds for the purposes of research into means of rehabilitating devastated areas in the Federation, especially by introducing site-improving tree species. It was not until 1954, when the Department obtained the services of an ecologist, that work really began in earnest.

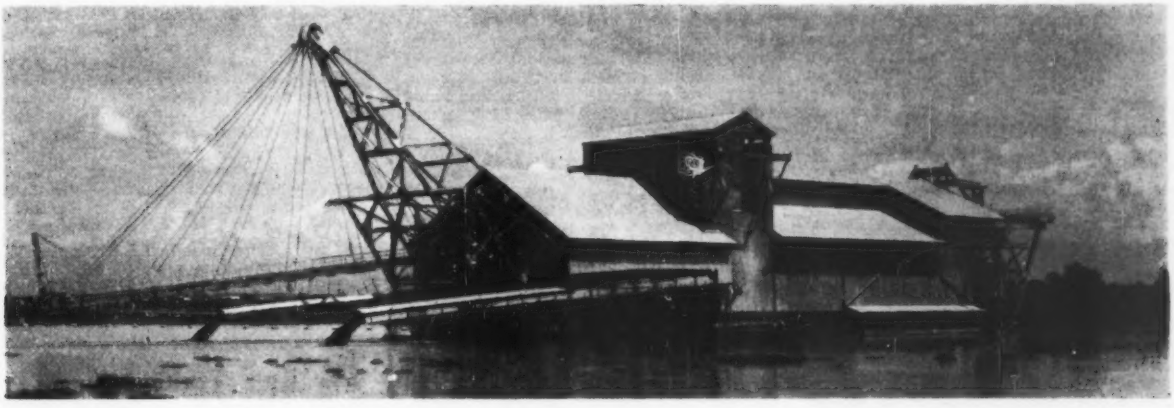
Now Mr. B. A. Mitchell, B.Sc.(For.), the ecologist at the Forest Research Institute, Kepong, has set out in his Department's official journal, "The Malayan Forester", for October, the prospects as they appear after the first two years' work.

He considers that about one-half to two-thirds of the worst areas could be revegitated or planted up with a good prospect of success. These areas include tailings from old gravel pump workings, surface workings on hillsides (now prohibited) and old uncontrolled dredge workings. The estimated cost of rehabilitating and planting these areas is put at M$150 per acre.

Over an area estimated to aggregate around 20,000 acres, Mr. Mitchell concludes that costly topographical reconstruction would be necessary before planting could be undertaken with any prospect of success. These areas are principally along the Main Range foothills and include steep slopes of continually eroding bare sand. The cost of the drastic treatment measures, including fertilization and planting, is put at M$800 per acre.

Referring to land where active mining is extant, Mr. Mitchell does not envisage that any feasible measures can be taken other than the enforcement of levelling and sliming conditions imposed in current mining leases.

He entertains a hope that improvements in recovering methods will make it worthwhile to re-mine old tailings, which would offer a chance to carry out spoil disposal to alleviate irregularities in surrounding tailings.



Rear view of the Kuala Kampar Tin No. 2 Dredge showing the tailing chutes. The site is Malim Nawar in the Kinta Valley, Perak

A plea is made that in opening up virgin mining lands a far-sighted planning of working and spoil disposal will pay big dividends. If such areas can be mined exhaustively in the shortest possible time, many of the existing anomalies and difficulties in disposal of tailings and the rehabilitation of the land would disappear. This, says Mr. Mitchell, would require co-ordinated exploitation including planned working of high- and low-grade areas by a combination of dredge and gravel pump mines, control of drainage, river flow, tailings dumps and finally rehabilitation in the light of expected land use of the area.

He sees little hope of achieving that object as, he points out, the existing system of land alienation, the economic effect of tin price on the working together of high- and low-grades ground, the difficulty of co-ordinating the work of dredges and gravel pump mines, are factors which militate against its practicability.

Any scheme for rehabilitation, whether by re-afforestation or other means, will require the adherence to a Federal land utilization policy to ensure that the land is alienated for rehabilitation by the most appropriate method, and the means of financing the work must be decided.

Machinery and Equipment

Diamond Drilling Around the World

An interesting cross-section of mining endeavour is provided by the literature recently published by Boyles Bros. Drilling Co., Ltd. This Vancouver company, supplying both surface and underground diamond drilling equipment, is active in many parts of the world on a variety of mining jobs. Indeed, work is being pushed forward in the home province of British Columbia, as well as in many other areas of Canada and in the United Kingdom, Northern Rhodesia, British Guiana, and South Africa.

The company manufactures a wide range of diamond drilling equipment, including air-powered underground drills, surface frame-mounted drills and pumps, a casing puller and water heater, diamond bits and the BBS-I and BBS-I JR drill mast. Latest addition to these products is the Bazooka drill, with BVB-6 air-powered vane motor, 5¼ in. air-feed cylinder assembly and bipod mounting. With BVB-4 motor, the assembly registers 11 h.p. and an air consumption of 200 to 300 cu. f.p.m. With BVB-6 motor, ratings are 16 h.p. and 300 to 400 cu. f.p.m.

The Bazooka is the lightest weight air-powered diamond drill ever manufactured by Boyles Bros. It can be easily moved, set up and operated by one man, the motor of the BVB-4 weighing 30 lb. and that of the BVB-6 42 lb. A built-in water-swivel is incorporated in the rear of the motor.

This drill is claimed as being equally suited for blast hole or core drilling with high penetration rates, is easily operated in confined spaces, and is equipped with water, feed and throttle valves. The unit can be supplied with a variety of mountings. Feed is available in 15 in., 24 in. or 30 in.

PUMPING MINE LIQUIDS

Among the many advantages of the centrifugal pump are small size and weight, easy drive by electric motor on the same baseplate, minimum wear and tear, and noiseless running. Modern methods of research have led to the development of pumps of corrosion-resisting material for dealing with acids, acid water, and other deleterious liquids employed in many processes in the mining industry.

Typical of the latest practice are the "CH" and "CHV" pumps of the Pulsometer Engineering Co., Ltd. All parts of these pumps in contact with the liquid are constructed of suitable metals for the purpose, such as stainless steel, acid-resisting bronze, austenitic cast-iron and steel, or aluminium alloys. As these metals are expensive, their weight is reduced to a minimum consistent with strength and rigidity, which are increased by a cast-iron hood and a large diameter shaft well supported on external ball and roller bearings and specially protected from any contact with injurious chemicals. This is important because of the tendency of most chemically resistant metals to be prone to seizure, and many deleterious chemicals have little or no lubricating properties.

In the "CH" pump there is a single inlet impeller of the shrouded type, surrounded by a volute casing; but in the "CHV" pump, which will handle products containing fine solids in suspension, or fibrous matter, an open type of impeller is embodied with renewable side plates rigidly fixed to the casing. These plates are adjusted as required to give proper axial alignment to take up any wear if the liquid is abrasive, maintaining the correct clearance and ensuring also that there is little or no pressure on the gland. The casing has an axial suction facing, studded to take British standard pipe connections, whilst the delivery branch is tangential, flanged and drilled and provided also with a connection for a gauge.

Careful design of the impeller reduces the pressure on the stuffing box to a minimum, so that little or no leakage takes place, whilst in addition a deep stuffing box is fitted having a double gland and double lantern bush. The first traps and leads any leakage to the drain dish and can be connected to a water service for condensing or diluting harmful liquids, or for the circulating of a sealing liquid, whilst the second lantern bush can be used for a grease or similar seal and for lubrication of the packing in the outer gland.

In the ordinary standard construction, the shaft is made of a similar material to the pump parts, while protection also is given to the bearing against the entry of liquid from the gland by a combined water thrower and labyrinth seal, which is fed with grease from the bearings, each of which is provided with grease nipples.

AN ELECTROGYRO LOCOMOTIVE

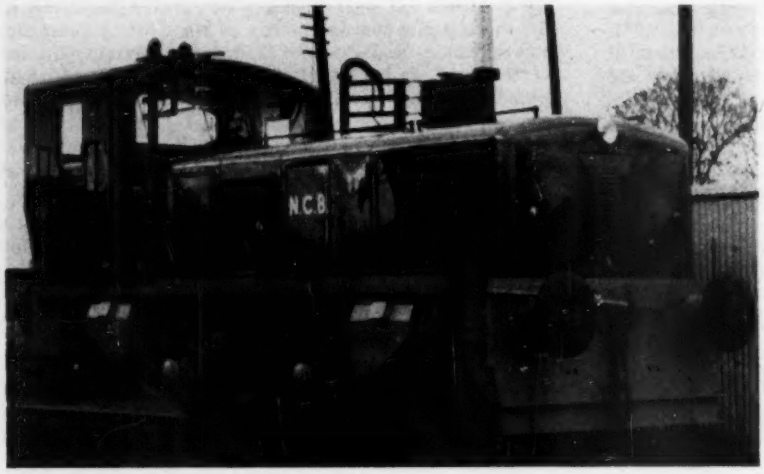
The National Coal Board have developed a novel type of shunting locomotive, now undergoing surface trials at Seaton Delaval in Northumberland. Known as the electrogyro locomotive, it derives its power from two large flywheels which rotate at speed to store energy which is then converted into electrical power and used to drive the locomotive.

The principle employed is similar to that used in a child's "push and go" toy. An electrical charge is supplied from a contact mast and through two induction motors. These start the flywheels storing kinetic energy. When the locomotive moves the reverse happens, the stored energy being drawn off in the form of electric power by the two traction motors which turn the road wheels.

About two and a half minutes are required to speed the gyros enough for about thirty minutes' operation. This corresponds to the usual haulage duty required in the mining industry of a short run followed by a stop. If the system and equipment prove to be technically and economically sound, they offer the possibility of hauling underground trains with improved efficiency and the construction of an underground gyro locomotive will be considered.

In the present trials, three charging stations are being used: one in the locomotive shed; and two, about a mile apart, on the track. When the locomotive is at a charging mast, a collecting pole is swung out pneumatically connecting up with four bare contact rails which are not alive until a pilot circuit closes the contractor in the charging station. When the mast is swung back the locomotive can move off.

The electrogyro is about 24 ft. long and weighs 34 tons; the flywheels are a



The National Coal Board's experimental electrogyro locomotive now undergoing surface trials at Seaton Delaval in Northumberland

little over 5 ft. in dia. and weigh about 1½ tons each. The stored energy of the gyros at maximum speed is 9 kWh. and they are cooled by hydrogen. The electrical equipment was produced by the Swiss firm of Oerlikon and the mechanical parts were built by Sentinels of Shrewsbury.

SLACK ROPE INDICATOR

The slack rope indicator produced by McPhar Manufacturing, Ltd., Ontario, is to provide a clear, audible signal to the hoistman that indicates the safety dogs are engaged on the skip or cage in operation. With this knowledge, the hoist operator can carefully raise the conveyance and release the safety dogs, thereby preventing sudden shock and heavy loading on the hoisting equipment. This signal system also eliminates the possibility of kinks or damage to the cable when reeled down the shaft on to the cage, and increases the safety factor in mine hoisting operations.

In operation, when the safety dog shaft is rotated, a mercury switch is closed which connects the batteries to the transistor oscillator. The transmitter coil is then energized, providing a signal which is inductively coupled by means of the hoist cable to the receiving coil. The receiving coil is permanently mounted below the sheave-wheel and coupled directly to the receiver. A directional speaker is mounted near the hoistman with an auxiliary volume control.

The system consists of three assemblies: transmitter, receiver and receiving coil with accessories and connecting cables.

A transistor oscillator provides a 100 K.C. signal with 600 cycle modulation; power being supplied by a standard 6-volt dry cell. The oscillator is a waterproof sealed unit which can be replaced if necessary. By the use of transistors and a minimum number of components, this oscillator will provide relatively trouble-free operation. The transmitter coil is contained in a waterproof, high impact strength casting, which also houses the oscillator. The complete unit is fastened to the top of the conveyance. The batteries are mounted inside the cage where they may be readily replaced. When the safety dogs are engaged, a mercury switch connects the batteries to the transmitter unit.

The receiver is a conventional 5-tube superheterodyne circuit using 115 volt 60 or 25 cycle a.c. power. The unit is mounted in a rugged steel case for protection and easy wall mounting. Adjustable volume and adjustable tuning for maximum sensitivity. A horn speaker is mounted in the vicinity of the hoist operator with an auxiliary volume control. A sensitive receiver coil is for fixed mounting on the catch plate or by special brackets mounted below the sheave-wheel, which allows the hoist rope to pass through the centre of the coil.

The Belmos Type SGU 2 gate end box. Below is the McPhar Slack Rope Indicator in plan. At left, the transmitter, and at right, the receiver coil

The design of the system includes several desirable features, including that of a conventional receiver with standard components which can be serviced by a qualified local electronics technician. Thus there are no special components or circuits. The transmitter housing is cast of a material that will withstand falling rock fragments and the high humidity and corrosive conditions encountered in mine shafts.

The oscillator section of the transmitter has transistors for long life and low power consumption, consequently requiring a minimum of service and battery replacements, and the system can be installed by the mine electrician and a helper in approximately six hours.

Test installations have been made in several mine shafts, and any problems apparent have been successfully overcome. To date, three units are in continuous use on mine hoisting equipment at different locations. The results of these life tests have been satisfactory, the original test unit having been in use for thirteen months.

A NEW GATE END BOX

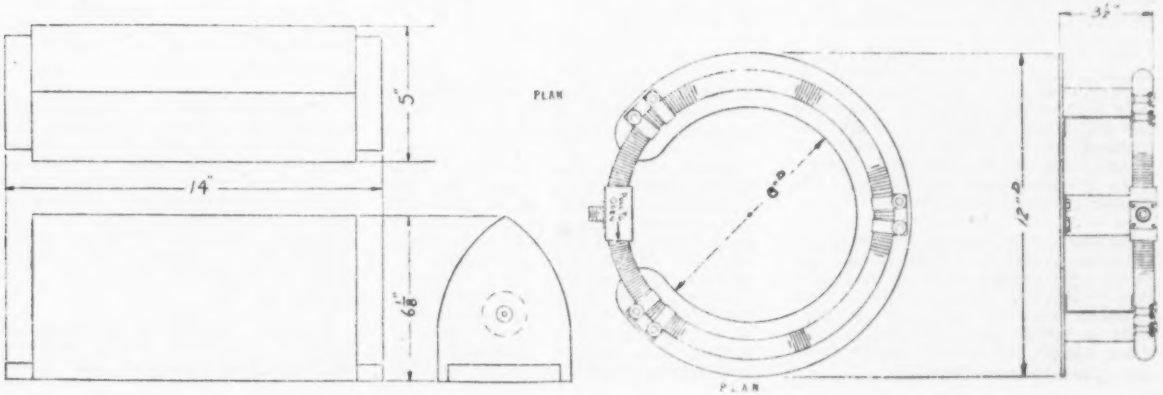
A new gate end box has recently been introduced by the Belmos Co., Ltd., and is in quantity production. The unit is designed to comply with the latest National Coal Board specification for size 2 gate end boxes and incorporates some interesting features.

Rated at 150 amps. and suitable for use on a.c. systems up to 650 volts, the unit comprises a two compartment welded steel enclosure, one compartment housing the contactor, protective and relay equipment, while the other houses the isolating switch.

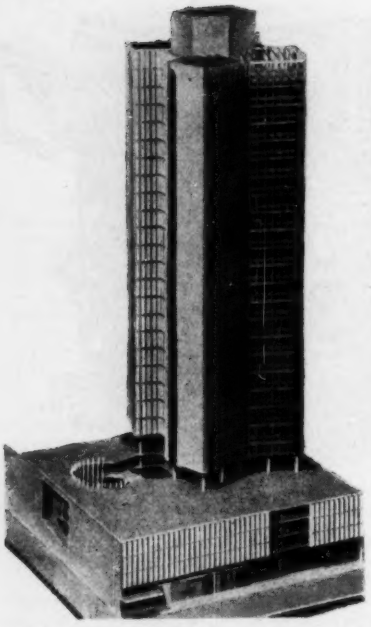
The contactor, overcurrent and control relays, voltage and current transformers, etc., are mounted on a removable chassis.

The isolating switch is of the load-breaking type and will handle current values of 1,200 amps. at 650 volts 0.25 power factor, equivalent to the stalling current of the largest motor likely to be associated with the box.

Protective and control features include overcurrent coils which cover the exceptionally wide range of 18 to 180 amps. with a continuous rating of 150 amps., intrinsically safe remote control circuit incorporating pilot core protection designed to the requirements of National Coal Board specification P 130, core balance earth leakage protection together with an intrinsically safe electrical lock-out circuit which prevents operation so long as an earth fault persists.



MINING MISCELLANY



Model of the building to be constructed by London County Properties of Rhodesia (Pvt.) Ltd. to accommodate the head offices of the Rhodesian Selection Trust Group in Salisbury, Southern Rhodesia

Machinery and equipment for an electrolytic copper refinery have arrived in Turkey and it is expected that the plant —with a capacity of between 4,000 and 5,000 tons—will be ready to go into operation by the end of 1958.

★

The Negev Ceramic Materials, Ltd., suppliers of high-grade washed quartz sand, flint clay and felspar, have recently exported to Europe a trial consignment of flint clay from Wadi Ramon in the Negev.

★

Large deposits of lead, zinc, copper, gold and silver have been confirmed in southern Kansu Province, China. Earlier reports said that iron, chrome, manganese and tungsten ore deposits had been found in the same area.

★

The Minister of Mines, Venezuela, has stated that phosphate rock deposits in Falcon, which are a National Reserve, will be used to supply 50,000 tons a year for the fertilizer plant of the Petroquimica. Exploitation concessions have been granted to private concerns.

★

The Soviet Central Statistical Board has announced that several industries, including oil and coal mining, have beaten their 1957 production targets. The board said that some 7,000,000 tons of coal and 1,000,000 tons of oil had been produced in excess of original estimates. Production of non-ferrous metals had also reached its target ahead of time.

★

Canada will supply $10,800,000 worth of industrial metals to India in the next six to eight months under the Colombo Plan. Canada's contribution to the Colombo Plan for economic development in south and south-east Asia is about $34,000,000 in the current fiscal year, which ends on March 31.

Plans for the erection of a 21-storey building in Jameson Avenue, Salisbury, S. Rhodesia, to house the head offices of the Rhodesian Selection Trust Group of Companies, have been announced by London County Properties of Rhodesia (Pvt.), Ltd. Under an agreement with Rhodesian Selection Trust Services, Ltd., the property company will erect the building, which it will own, and which R.S.T. will occupy on a long-term lease with the right to sub-let any accommodation in excess of its own requirements. The agreement provides for the property company to spend approximately £600,000 on the building in addition to the cost of land. The site, which is on the north side of Jameson Avenue, between King's Crescent and Moffat Street, was purchased last year at a cost of £105,000. It is expected that contracts will be placed in the next few months and construction will start in the middle of 1958 with a view to occupation during 1960.

★

The first meeting of the special Sub-Committee on Mining Explosions of the Coal Industry National Consultative Council took place in London on December 19. The sub-committee includes representatives of all the constituent bodies of the Council (the National Coal Board, National Union of Mineworkers, National Association of Colliery Overmen, Deputies and Shotfirers, National Association of Colliery Managers, and British Association of Colliery Management) under the independent chairmanship of Sir Andrew Bryan, formerly H.M. Chief Inspector of Mines and until recently a member of the National Coal Board. Sir Harold Roberts, H.M. Chief Inspector of Mines, was present as assessor representing the Ministry of Power. The sub-committee was set up by the Council to consider the sequence of mining explosions in recent years and to report to the Council on the steps that could be taken to prevent similar happenings in the future.

PERSONAL

Mr. P. H. Anderson and Mr. T. Reekie have been appointed executive directors of Rand Mines, Ltd. Mr. B. C. Twycross has joined the Rand Mines executive with duties in connection with the company's industrial undertakings. Mr. F. E. Hay and Mr. R. E. M. Blakeway have been appointed managers, Mr. A. J. Wood an assistant manager, and Mr. A. R. C. Fowler a consulting engineer.

★

Mr. Clifford Waite has been elected president of the British Overseas Mining Association and Mr. A. V. Conrad vice-president for the ensuing year.

★

Mr. K. C. Acutt has been appointed a deputy chairman of the Anglo American Corporation of South Africa, Ltd. He will continue to be resident director in the Federation of Rhodesia and Nyasaland. Mr. W. D. Wilson has been appointed managing director of the corporation on the relinquishment of that office by Mr. H. F. Oppenheimer. Mr. Wilson was formerly assistant managing director. Mr. Philip Oppenheimer has been appointed a director of the corporation. An executive committee of the board of directors has been established as: Mr. H. F. Oppenheimer, Mr. R. B. Hagart, Mr. K. C. Acutt, Mr. W. D. Wilson, Mr. W. Marshall Clark, and Mr. T. Coulter. On his appointment to the executive committee of the board, Mr. Marshall Clark has relinquished his present position as a manager of the corporation.

★

Mr. G. H. Fairmaid has ceased to be chairman and managing director of the Pahang Consolidated Co. Ltd., but remains a director. He is succeeded as chairman by Mr. J. N. Davies.

★

Colonel Donald M. Liddell, a partner for seventeen years in the firm of Weld and Liddell, engineers and economists, and now engaged in independent practice, will receive the gold medal of the Mining and Metallurgical Society of America for outstanding contributions in the field of non-ferrous metallurgy and research. The award will be presented at the Society's annual dinner on January 29. Colonel Liddell has written many books on metallurgy and mineralogy.

★

Mr. Gordon Churchill, the Canadian Trade Minister, has announced that a permanent trade mission office will be set up in Ottawa to help stimulate the flow of imports from the United Kingdom. The secretary will be Mr. Peter Stursberg, a former journalist and radio commentator, who co-ordinated the mission's publicity in Britain.

★

Mr. Ralph D. Parker, vice-president in charge of Canadian operations of International Nickel, will move his headquarters from Copper Cliff, Ontario, to the company's offices in Toronto early in 1958. The Toronto offices have recently been expanded and moved to larger quarters at 55 Yonge Street. Mr. Ralph H. Waddington, Mr. James C. Parlee, Mr. Richard A. Cabell, and Mr. Paul Queneau have been elected assistant vice-presidents of International Nickel. Mr. Waddington has also been appointed general manager of the parent company's Ontario division and Mr. Parlee general manager of the Manitoba division. Messrs. Cabell and Queneau have been elected vice-presidents of the International Nickel Co., Inc., the United States subsidiary of the Canadian company.

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Mr. S. A. Dohm, chairman of the Dohm Group of Victoria, London, sailed from Southampton on December 19 on a six-week trip to Africa.

★

Consequent upon an approach from the directors of the Colliery Explosives Co. Ltd., of Newton-le-Willows, Lancs., Imperial Chemical Industries Ltd. has acquired the whole of the issued share capital of that company, consisting of 108,000 shares of £1 each. The new subsidiary, which manufactures various commercial blasting explosive compositions, will be administered by the Nobel Division of I.C.I.

★

A general meeting of the North Staffordshire Institute of Mining Engineers will be held on January 6, 1958.

Metals and Minerals

The World's Uranium Needs

An encouraging assessment of the future outlook for the uranium industry is given by Sir Edwin Plowden, chairman of Britain's Atomic Energy Authority, in an article published in the December, 1957, issue of *Optima*.

Examining the probable size of the demand for both military and civil purposes, Sir Edwin considers that the most reasonable assumption to make about military demand in an "undisarmed" world is that it will continue at about the present level. In the event of general nuclear disarmament, the demand for uranium would obviously fall for a time, but it would be pessimistic to deduce that the longer-term effects would be bad for the uranium mining industry, since additional technical resources would become available for civilian purposes and doubtless a direct acceleration of the development of civilian uses of atomic energy would result. Even in so far as the freed resources were not applied directly in the nuclear field, they would go to speeding other technical advances, almost all of which call for increased supplies of power.

As regards civilian demand, the general position is that the requirements of uranium for nuclear power for civil purposes in the free world is increasing and will continue to increase, both because of the growth in the demand for electricity and because of the need to replace stations which become obsolete. The actual size of the demand for uranium will be partly dependent upon the price at which it is offered by the mining companies. Whether an electricity authority decides to embark on a nuclear power programme at all may well depend on the price of uranium. In the second place, the price at which uranium is offered, and the view which purchasers take of the future trend of prices, will have an important influence on electricity authorities in many countries when they come to select the type of reactor on which they will rely for nuclear power. If they think that uranium will be cheap, they will be more disposed to consider types of uranium which do not achieve such a high "burn-up". In that event, the demand for uranium could be great.

Under Britain's new nuclear programme 5,000-6,000 mW. of nuclear capacity will be installed by the end of 1965. No programme for the period after 1965 has been announced, but it is probable that there will be some 20,000-30,000 mW. of nuclear capacity by 1975. Between 1,000 and 2,000 tons a year of uranium oxide will be required from the time the first stations have to be fuelled: i.e. from 1961 onwards. Demand will increase steadily until well into the 1970s, when it will probably lie between 5,000 and 10,000 tons a year.

Dr. Libby, a member of the United States Atomic Energy Commission, estimates American civil uranium requirements at 20,000 to 30,000 tons of uranium oxide by 1975. It is possible, therefore, that the total amount of uranium needed by the Free World for civil purposes in the 1970s could be in the region of 50,000 tons a year, and still rising. By 1960 the total produced is likely to be about 40,000 tons of uranium oxide a year, and no doubt there will be further expansion. With production on this scale, prices should be competitive.

This tonic article comes at a time when considerable anxiety has been caused in the United States by Mr. Jesse C. Johnson's recent announcement that the A.E.C.'s present commitments to purchase domestic and foreign production should supply the projected military and power requirements of the United States Government for about the next ten years. Mr. Johnson emphasized the desirability of limiting future domestic output to about the level of the Commission's annual needs, in order to avoid a major cutback at some later date.

The effect of this announcement on the United States uranium industry has been heightened by the fact that several large companies are spending some $75,000,000 on development of new uranium resources in the Ambrosia Lake region of New Mexico. It is expected that output from the twelve deep shafts being sunk at Ambrosia will reach nearly 8,000 tons a day within the next twelve months, almost doubling the current total output of all United States uranium mines. The four giant mills being built at Ambrosia by major oil and mining companies will grind 7,275 tons of ore a day, compared with the 10,010 tons processed each day by the fourteen United States mills currently in operation.

At a meeting held at Denver to explore the potential requirements of future commercial markets for uranium, it was stated that the pace of uranium discovery was proceeding at a rate of about two and a half times faster than was required to supply the future annual requirements of all mills currently contracted for by the A.E.C.

As a result of Mr. Johnson's announcement, many of the smaller companies have suspended exploration and development. Anaconda, which has a large uranium mine and a 3,000-ton-a-day mill, has also announced some reduction in its exploration activities as a result of the A.E.C.'s new milling policy. Nevertheless, this company does not foresee any great difficulty in the eventual transition to reliance on commercial markets. No sharp cut-off in Government buying is anticipated after 1966, but rather a tapering off which will be offset by growing commercial purchases. Anaconda considers that in the event of any temporary surplus, excess production could be stockpiled until the surplus was absorbed by increased usage in later years.

Mr. Johnson emphasizes that the A.E.C.'s decision not to enter into additional contracts for the purchase of uranium concentrates does not mean that the A.E.C. has too much uranium, neither does it mean that the industry has stopped growing. Available reserves are still regarded as inadequate to handle prospective peacetime uses of uranium. By 1959, United States mills will be grinding about 7,000,000 tons of ore a year to produce between 15,000 and 18,000 tons of uranium oxide a year, compared with an annual rate of about 9,700 tons of concentrates at present. This will increase the industry's income from A.E.C. payments to about $300,000,000 a year by 1959, compared with a current rate of about $200,000,000.

NICKEL AGAIN PLENTIFUL

The year 1957 brought a turn-about in the supply demand situation for nickel, states Dr. John F. Thompson, chairman of the board of International Nickel, in his year-end review of the nickel industry. After many years of nickel shortage for civilian purposes, the combined supply of market and premium price nickel came into close balance with demand in nearly all areas of the world during the last part of 1957. In fact, in the largest market, the United States, the supply exceeded the demand.

This change was brought about by a record high free-world production of nickel, sharply reduced defence demands, and the United States Government's endeavour to divert to industry during the year all nickel scheduled for stockpile intake. Some nickel was also released from the United Kingdom's stockpiles. While Free World defence requirements were substantially lower than in 1956, civilian consumption increased to the extent of approximately compensating for the reduced defence consumption.

Free World nickel supplies in 1957 are estimated at 245,000 s.tons, compared with 225,000 s.tons in 1956 and 212,500 s.tons in 1955. Deliveries of the metal by Canadian producers will reach a new record total of about 180,000 s.tons, representing approximately 75 per cent of the Free World's supply. Of the balance available to the Free World, Cuba will account for about 9 per cent, United States 4 per cent, and New Caledonia, Japan and others 12 per cent. INCO operated at capacity in 1957 for the eighth consecutive year. The company's deliveries of nickel in all forms will exceed 145,000 s.tons, an increase of about 2,500 tons over deliveries in 1956.

Of the total Free World nickel supplies available in 1957, an estimated 60 per cent was delivered to the United States. Whereas there have been recent years in which 40 per cent of the Free World's nickel was consumed by defence and stockpiling requirements, only about 20 per cent was wanted for these purposes in 1957.

Barring any presently unforeseen large increases in defence demands, Dr. Thompson expects that there will be more nickel available to the industries of the Free World this year than in 1957. Consequently, the supply-demand situation throughout the world in 1958 should be in close balance, although some supplies offered during the year will continue at premium prices. In view of the announced desire of the United States Government to divert to industry all nickel scheduled for stockpiling, it is expected that the supply in that country will exceed the demand.

Creating large markets in preparation

for 1961, when the nickel production capacity goal of between 325,000 and 337,500 s.tons is achieved, is a major task confronting producers. In recent years, much time and effort have been spent by industry and government agencies in replacing nickel-containing alloys with substitutes which used less nickel or none at all. Although some of these substitutes are likely to continue in general use, the vast majority of cases in which specifications were thus downgraded represented a compromise, or an acceptance of conditions which, while far from ideal, were considered necessary at the time. Dr. Thompson points out that, as a result, there are today many specifications which should be revised to take advantage of the increased new nickel supply.

*

INCO has announced an increase in the price of electrolytic refined nickel for Canadian consumption. This rise, from 69 Canadian cents to 71½ cents per lb. f.o.b. Port Colborne refinery, became effective on January 1. The price of nickel to the United States or any other country is not affected.

BAIE COMEAU STARTS UP

The first metal has been poured at the new primary aluminium works of the Canadian British Aluminium Co. Ltd., at Baie Comeau, Quebec. This smelting works, which has been under construction for about two years, is designed for an ultimate output of up to 180,000 tons of virgin aluminium. The project will be completed in four phases of 45,000 tons, the first of which is in operation. The second 45,000-ton stage is expected to be completed late in 1958. All production from the first stage is intended for British Aluminium Ltd., which owns a controlling interest in the project.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

As it is unwise to try and read anything into the price movements over a holiday period, let it suffice to say that since December 19, market members have been preoccupied with a certain amount of end-of-year squaring up, both on their own behalf and on behalf of clients, and that price differences are negligible with the exception of zinc which has shown unexpected weakness.

COPPER IN RETROSPECT

At this season of the year it is always interesting to look back over the preceding twelve months and to note the changes in the picture. Sometimes these come as a shock to those who are preoccupied with day-to-day affairs, and this year has certainly proved a period of great activity and price fluctuation.

The sellers' quotations for copper on January 2, 1957, were £267 for cash and £266 for three months, whilst warehouse stocks amounted to approximately 4,000 tons. Today the quotations are some £85 per ton lower and the metal in warehouse on Monday totalled 20,304 tons. It is generally accepted that the fall in price, a continuation of a movement started in the spring of 1956, is due more to over-production than to lower consumption. New sources of supply which were conceived at the time of the Korean crisis came into production during the year, whilst consumption remained steady throughout the world outside the United States but in that country showed a marked decline, especially in the last half of the year.

Although recently numerous steps have been taken to cutback production, the total effect has been rather to lessen confidence than to rectify the production/consumption figures. This lack of confidence, combined with the over production, has enabled the London Metal Exchange to perform once more one of its basic roles, namely, that of carrying surplus metal by means of a sufficiently large contango to make such an operation financially worthwhile.

Opinions as to the future differ very considerably. One school of thought is that general industrial activity throughout the world will continue to diminish and that any increase in armaments will not have the same direct effect on some of the main non-ferrous metals as in times past owing to the revaluation which has taken place in the types of armaments required. The other school thinks that consumption will not diminish from its present level and that producers will be forced to cutback sufficiently to eliminate surplus production, and when this is the case any slight rise in industrial activity will have an immediate effect on price levels. Which school of thought is right it is impossible to judge, but *The Mining Journal* has shown its faith in the future in the leading article of the issue dated December 27.

TIN PICTURE CONFUSED

In the tin market events have been overshadowed by the coming into operation of the International Tin Council's Buffer Pool which has limited the year's fall in price from about £770 at the beginning of the year to £730 per ton today. This has only been done through the buffer stock being built up very much faster than was ever anticipated, and even though some of its holdings do not appear on the official returns, the stocks of tin in official warehouses on Monday totalled 12,182 tons against a paltry 750 tons at the beginning of the year.

We enter the New Year with export quotas in being, the buffer pool standing at over half the envisaged tonnage of 25,000 tons, and what is almost a buyers' strike in America. On top of this has to be considered a strike at Penang and the dislocation in shipments of concentrates from Indonesia, not only on account of shipping difficulties but also, it is understood, because the government there is no longer willing to allow the concentrates to be treated in Holland.

From this confused picture it is almost impossible to forecast the future, although most people consider that the Tin Council has shown its willingness to move quickly and decisively when necessary and there is therefore little reason to suppose that its aims will not be achieved, helped by a shortage of tin which the majority of people expect to become evident about Easter. In the immediate present there is again a slight tendency for a backwardation to develop, probably owing to the complete lack of interest on the part of consumers which forced a large proportion of the daily production on to the London Metal Exchange in the shape of sales of forward metal. On Thursday morning the Eastern price was equivalent to £734¼ per ton c.i.f. Europe.

LEAD-ZINC POSITION UNHAPPY

Both the lead and zinc markets have gone from conditions of scarcity to plenty which has resulted in the elimination of the backwardation in both markets and a reduction of almost £45 per ton in the price of lead and £37 in the price of zinc. The major surprise has been the continued weakness in zinc to a level which is beginning to make uneconomical the transport of concentrates and other raw materials.

If it were necessary to pinpoint any one cause for the recession, one could point to the general economic conditions in the States, the over-production in that country, and in recent months the probability of greatly increased import duties early in 1958.

It must be remembered that the lead and zinc mining industries in America have been petitioning for a number of years for some sort of protection and that on the last occasion when increased tariffs was refused, a price support policy was inaugurated which in the course of the last two years has taken hundreds of thousands of tons of both metals off the market, with the result that prices have been maintained artificially high and little attempt has been made to make the necessary cutbacks in production until the middle of this year.

Outside the States there has also been a tendency for over-production but this has been eased, partly by sales to America and partly by the operation of barter transactions with America. Generally speaking, it can be said that last autumn the basic positions of both metals was very unhealthy and it can well be that 1958 will see lower prices and a very much more bitter struggle to reverse the trend than in the case of either copper or tin.

In general, it can be said that the London Metal Exchange has taken yet another stride towards regaining its unique position in the world and although some tend to blame its operations for present price levels, the majority now know that its quotations are an accurate reflection of the world position of the four metals which are dealt in and that it remains the one place in the world where metals can be bought or sold in any quantity, provided the price is right and when there is over-production the right price must of necessity be low.

Closing prices and turnovers are :

	Dec. 19		Jan. 2	
	Buyers	*Sellers*	*Buyers*	*Sellers*
COPPER				
Cash	£180½	£180¾	£179¼	£180¼
Three months ..	£185	£185½	£183	£183½
Settlement ..	£180¾		£180½	
Week's turnover	9,225 tons		8,600 tons	
LEAD				
Current ½ month	£73½	£73¾	£72	£72¼
Three months ..	£73½	£73¾	£72	£72¼
Week's turnover	4,450 tons		3,450 tons	
TIN				
Cash	£730	£730½	£730	£730½
Three months ..	£730¼	£731	£728¼	£729
Settlement ..	£730½		£730½	
Week's turnover	2,130 tons		2,575 tons	
ZINC				
Current ½ month	£63	£63½	£61½	£61½
Three months ..	£63½	£63¾	£61½	£61½
Week's turnover	3,900 tons		5,225 tons	

London Metal and Ore Prices appear on the inside back cover.

Mining Finance

B.O.M.A. Writes a Letter

The part played by the British Overseas Mining Association in securing adequate recognition by the United Kingdom Fiscal authorities of the special problems of the British overseas mining industry is now part and parcel of British overseas mining history over the last decade. However, for those unaware of what B.O.M.A. has accomplished during the last ten years, a brief and wholly modest summary of the Association's work was given by its president, Mr. A. M. Baer, at the general meeting held at the beginning of this week, and will be found on page 24 of this issue.

In connection with B.O.M.A.'s most recent achievement—the creation of a new class of company known as Overseas Trade Corporations—Mr. Baer declared that while the provisions of the legislations so far enacted go some way towards satisfying the Association's claims, the complex nature of the overseas mining industry has thrown up some special situations which are in need of ironing out for the benefit of all concerned.

Mr. Baer was, of course, referring to those mining finance houses and holding and co-ordinating companies of various descriptions, which are responsible for the organization and financing of the greater part of modern mineral exploration and development, which do not, at present, qualify for O.T.C. benefits. The Association has therefore recently addressed a letter to the Chancellor of the Exchequer on this subject. This letter suggests, firstly, that when a company not itself carrying on a trade has non-resident subsidiaries which are not carrying on a trade in the United Kingdom, dividends from those subsidiaries should be treated as O.T.C. trading income. The second point raised in the letter suggests that when an Overseas Trading Corporation holds, as a trading interest and not merely as a portfolio investment, not less than 25 per cent of the ordinary shares in another company carrying on a trade outside the United Kingdom and not excluded under Section 24 (3) of the Finance Act of 1957, dividends from that other company should qualify as O.T.C. trading income.

It is to be hoped that the Association's endeavours to secure the validity of its claims for these types of companies will soon find approval with the Inland Revenue authorities, for, as the present legislation stands, many mining companies of the very type for which, in the Association's view, the O.T.C. provisions were designed may be prejudiced.

Since 1946, when the Association was formed, its one abiding interest has been to find ways in which to lighten the swingeing tax burden suffered by the British overseas mining industry. However, last year the question of taking steps to ensure that the number of young men offering themselves for training in such subjects as mining engineering, geology and extractive metallurgy, is maintained at a level sufficient for the anticipated needs of the overseas mining industry was brought within the scope of its activities. A working party was set up to make a comprehensive study of this problem, and recommended that scholarship facilities at present offered by the industry should be expanded, to effect which the Association decided to establish a Central Scholarship Fund.

An important aspect of this scheme is that it will make provision for giving adequate assistance to students who would be debarred under "means tests" from accepting scholarships offered by the States and other sources. A committee is now in the process of working out details of this new scheme, and it is hoped that an announcement will be made shortly.

LONDON MARKET HIGHLIGHTS

The closing days of 1957 failed to produce much in the way of highlights in the mining share markets. Naturally enough, business fell away during the holiday period, but it was significant that prices of South African gold shares steadily edged forward. Interest again centred mostly on the newer mines with buyers looking forward to the forthcoming December quarterly reports.

Among the few features, Western Holdings climbed to 90s. 7½d. and Free State Geduld held firm in front of their new issue of shares at 80s. "Ofsits" at 59s. reflected the firmness of the O.F.S. group as a whole.

In the Far West Rand section, hopes of good quarterly development results were represented by buying of Buffelsfontein (40s. xd.), Vaal Reefs (40s. 6d. xd.) and Hartebeest (60s. xd.). The older mines moved slowly, but some of the uranium producers brightened on a reassuring forecast for the metal's future by Sir Edwin Plowden in an article in *Optima*. Randfontein hardened to 25s. 3d. xd. and Luipaards were dearer at 10s. 3d. xd.

Platinums began to recover after their previous weakness. Potgietersrust, in particular, improved to 6s. 9d.; the view was taken that having fallen so far from a peak last year of 17s., the price must have discounted a likely reduction in the interim due to be announced next month.

Other mining share markets continued to be overshadowed by Wall Street. Nobody cares to say how long the present U.S. recession will last, but its effect on base metal prices has already made itself painfully obvious. In copper, the metal price looks unlikely to go much lower as things stand. But at the same time there seems to be small likelihood at present of a sustained recovery. Copper share prices have thus continued to drift, but at the present levels they could be very responsive to any recovery either on Wall Street or in the metal. In the circumstances, a fair amount of interest is centred on the progress of the Messina company's offshoot, Mangula. The shares of this company will be dealt in for the first time next week. They are not underwritten and are expected to open at their par value of 5s.; for those who feel that copper has in fact grounded in price, Mangula at par would look to be a likely speculation.

Tin shares had more than their fair share of troubles to contend with. In addition to worries about the possible effects on individual mines of output quota restrictions, there was also a further dose of bad news from the tinplate industry which reported more redundancy at the South Wales tinplate mills. Share prices weathered the storm well enough, though. There was no fresh buying, of course, but few holders saw the need to sell in view of the good income and comfortable cash resources represented by many tin companies coupled with faith in the future of the metal.

Otherwise, lead-zincs were not so favourably placed. Here, everything must depend on a revival of U.S. business activity and at present metal prices very few mines can be producing lead and zinc at a profit.

CORONATION'S SATISFACTORY RESULTS

Coronation Syndicate owns three gold producers, namely Arcturus, Muriel, and Tebekwe. During the year ended June 30, 1957, Arcturus earned a working profit of £64,611, before charging depreciation, compared with £61,166 the preceding year. The contribution to group profits from the Muriel mine was also higher, working profits before depreciation rising to £134,455 compared with £111,307 the preceding year. Working profit from Tebekwe, on the other hand, was lower at £17,662 against £38,509, and this mine has now ceased operations entirely and has been placed on a caretaker basis while dismantling and collecting plant and material is completed.

Further details of the company's operations during the year ended June 30, 1957, are to be found in the speech by the chairman, Mr. J. H. Mitchell, on page 22 of this issue.

JANTAR TAKES A VIEW ON THE OUTLOOK

A company meeting awaited with more than usual interest is that of Jantar (Nigeria), whose preliminary results for the last complete financial year were released this week. These present a somewhat unusual and depressing picture. During the year ended September 30, 1957, profit before tax amounted to £48,388, a rise of around 45 per cent on the previous year's earnings. This is a good result by any standard, not least in view of the considerable uncertainty in the columbite market, and the decline in the tin price by about £50 per ton. Admittedly, the taxation position was not so good this time, the net figure of payments less write-backs being £13,478 against

£2,726, but available income was still £4,000 higher at £34,910. Yet no payment is to be made this year, against 4½d. per unit last year which, it may be noted, cost only £19,406.

The reason given by the company for its decision is that "in view of the difficulties with which the company is faced in the coming year, it is necessary to conserve its cash resources". The major difficulty of the coming year will, of course, be the restriction on tin output imposed by the I.T.C. If it can be assumed that the basis for the cut to be applied to Jantar will be similar to that for Gold and Base Metals, it appears that Jantar will be allocated something like 40 tons during the first quarter of the scheme's operation. This compares with an output during the past financial year averaging around 70 tons per quarter. Over the last few years, Jantar has made considerable expenditure on modernization of its various gravel-pumping sections. In a time of unrestricted output, this would have proved a most valuable weapon—in fact, production costs per ton of combined concentrates were reduced by almost £60 in the previous year—but with restriction the weapon has become double-edged. Jantar needs to work to capacity to realize the benefits of its modern plant, and the cutback must, therefore, hit the company where it hurts.

It goes without saying that columbite can no longer be relied upon as the profitable addition to revenue it once was, and Jantar can hardly look in this direction for assistance in the present difficult time. All in all, therefore, one feels sympathy for Jantar in its dilemma, whilst reserving judgment on the dividend decision until Mr. Tarbutt's speech at the annual meeting to be held on January 29.

WESTERN SELECTION'S CANADIAN INTEREST'S RICH GOLD STRIKE

Cordoba Mines, in which Western Selection and Development Company has a substantial interest directly through shareholdings and indirectly through Anglo-Barrington Mines, their wholly owned subsidiary, announced at the end of last week that pattern sampling over widths of 5 ft. to 6 ft. on its property yielded assays running as high as 21 dwt. per ton gold, together with copper values averaging 0.94 per cent copper.

Cordoba Mines' field geologist, in his report, states that "Surface values of this order have seldom, if ever, been obtained from any of the producing mines in the district, none of which has any appreciable copper."

Accordingly, a drilling campaign has been started, and it should not be too long before results from this work are available. Meanwhile, it is to be noted that the value of 1.05 oz. gold per ton represents the equivalent of $36.75 per ton, and should the drilling programme outline a sizeable orebody yielding values of even half this figure, the future prospects of Cordoba Mines and, *a fortiori*, Western Selection and Development Company in Canada would be bright indeed.

Accompanying the above statement was a progress report from Genrico Nickel Mines, with which Western Selection and Development is also closely identified. During the past season, work on Genrico's properties has confirmed certain geological factors which are believed to show that there is undoubtedly the strongest possibility of economic orebodies on the Tow Lake property of Genrico Nickel Mines.

Rand Marginal Mines.—The August conference on the problem of the Rand's marginal mines has submitted a list of proposals to Dr. Albertus van Rhijn, S.A. Minister of Mines. Should the report be accepted, negotiations between the Union Government and the mines and other interested bodies would follow.

Witbank Colliery.—At £387,169, Witbank Colliery's net profit before tax in the year ended August 31 last was virtually unchanged from the previous year's £387,868. Dividends totalling 7s. 6d. per share were declared during the year, against 6s. 6d. in 1956, and net current assets improved to £313,863 from £251,848. Extracts from the accounts and the directors' report appear on page 24.

Queen's New Year Honours. — A knighthood has been conferred on Mr. A. S. Ward, president of Thomas W. Ward, Ltd. Mr. N. A. Gass, chairman of British Petroleum Co. Ltd., has received the K.B.E. C.B.E. awards in the New Year Honours List include Mr. E. H. Ball, managing director of the British Thomson-Houston Co. Ltd.; Mr. A. E. Crook, prin. inspc. mech. eng., Mines Inspectorate; Mr. R. Ringham, chairman of East Midlands Division, National Coal Board; Mr. R. C. Leach, general manager and director of Burma Corporation (1951) Ltd., and Mr. R. J. Hendricks, lately resident director and manager, Cyprus Mines Corporation, has been awarded the C.B.E.

Christmastime.—Once again *The Mining Journal* received a delightful variety of calendars, diaries and Christmas cards from friends and well-wishers. We would like to acknowledge the good wishes for the New Year received from the following: Anderson, Boyes Ltd., Atlas Copco, The Brush Group Ltd., The Butterley Co. Ltd., Cyprus Government Office, Denver Equipment Co., Holman Brothers Ltd., Mavor and Coulson Ltd., Mond Nickel, Westfalia Lünen and Hugh Wood and Co. Ltd. We would like to take this opportunity of again wishing all our friends at home and abroad a Happy and Prosperous New Year.

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CORONATION SYNDICATE LIMITED

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GROUP WORKING PROFITS AGAIN INCREASED

The fifty-second Annual General Meeting of the Company was held in Johannesburg on December 23, 1957.

Mr. J. H. Mitchell, O.B.E., Chairman of the Company, presided, and in moving the adoption of the report and accounts for the year ended June 30, 1957, said:

The Group mine working profits have again increased, amounting to £228,853 in comparison with £219,790 for the previous year. The premium on purchase of shares in subsidiary companies has long appeared as a fictitious asset on the Consolidated Balance Sheet. This premium, amounting to £42,551, has now been written off. At the same time, the opportunity has been taken of increasing the Group General Reserve to £145,000, which is sufficient to cover the book value of the Group's mineral claims and shafts which amount to £144,397. As a result of these adjustments, the carry-forward to unappropriated profit of the Group has been reduced from £58,100 to £9,483.

Arcturus Mine: The working profit was £64,611 before charging depreciation, compared with £61,166 for last year.

The ore reserves increased by 5,375 tons to 406,786 tons at the close of the financial year and the value of the reserves per ton was 7.3 dwt.

Muriel Mine: The Muriel Mine continues to make a substantial contribution to the success of the Group. This year, working profits were £134,455 before charging depreciation compared with £111,307 for last year.

Since the end of June, when the price of copper on the London Market was about £214 per ton, there has been a further fall in the market price, and we must therefore conclude that the days of earlier "ceiling" prices are over. The price may only stabilize at less than £200 per ton, and we can expect our profits for the coming year to reflect a reduction commensurate with the lower prices now prevailing.

Referring to production for the year, 311.5 tons of copper were produced compared with 277.5 tons for the previous year. In addition, 4,544 fine oz. of gold were recovered, an increase of some 250 oz. over the previous year.

Ore reserves at June 30 this year were 147,430 tons, an increase of 14,240 tons compared with last year, while the value per ton was 11.6 dwt. compared with 11.5 dwt. last year.

Tebekwe Mine: Working profit from Tebekwe Mine before charging depreciation, and before providing an amount of £4,999 which was written off claims, amounted to £7,662, the comparative figure last year being £38,509.

The Mine has now ceased operations entirely and the property has been placed on a caretaker basis while dismantling and collecting plant and material for disposal is completed.

The motion for the adoption of the report and accounts was carried unanimously.

The declaration of Final Dividend No. 11 of 12½ per cent for the year ended June 30, 1957, was confirmed.

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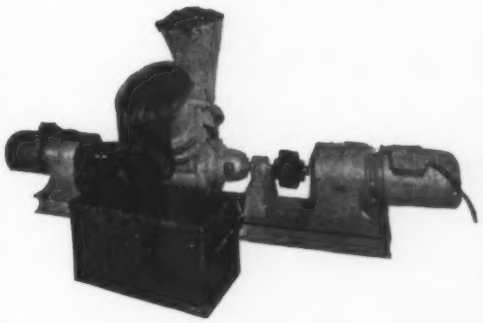

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BRITISH OVERSEAS MINING ASSOCIATION

NEED FOR EXTENDING THE SCOPE OF O.T.C. LEGISLATION

The 12th Ordinary General Meeting of British Overseas Mining Association was held on December 30, 1957, at 49 Moorgate, London, E.C.

Mr. A. M. Baer, the President, who was in the chair, in the course of his speech, said:

The provisions of the Overseas Trade Corporation legislation go some way towards satisfying the claims which the Association has consistently advanced on behalf of the overseas mining industry, particularly where U.K. operating companies are concerned, and to that extent they may be regarded as the culmination of the unremitting efforts of our Taxation Committee, to which the industry is undoubtedly greatly indebted.

The present organization of the overseas mining industry is, however, a very complex structure comprising many types of company. Some of these, such as the mining finance houses and holding and co-ordinating companies of various descriptions, which are responsible for the organization and financing of the greater part of modern mineral exploration and development, do not at present qualify for O.T.C. benefits.

The Association understands the desire of the tax authorities to move cautiously with this new departure in U.K. tax legislation, but hopes that, with experience of its application, the Government will find it possible to extend its scope to include these important sections of the overseas mining industry.

The claims of two such sections have been put forward in a letter which the Association has recently addressed to the Chancellor of the Exchequer. This letter suggests, firstly, that when a company not itself carrying on a trade has non-resident subsidiaries which are not carrying on a trade in the United Kingdom, dividends from those subsidiaries should be treated as O.T.C. trading income, and secondly, that when an Overseas Trade Corporation holds, as a trading interest and not merely as a portfolio investment, not less than 25 per cent of the ordinary shares in another company which carries on a trade outside the United Kingdom not excluded under Section 24 (3) of the Finance Act, 1957, dividends from that other company should qualify as O.T.C. trading income.

As regards the present legislation, the Association recognizes the need for careful scrutiny of claims for O.T.C. status and the application of certain tests for determining the validity of such claims. If, however, these tests are applied too rigidly, the position of some mining companies of the very type for which, in the Association's view, the O.T.C. provisions were designed, may be prejudiced, and the Association has drawn the attention of the Inland Revenue to this possibility.

Plan For Extending Scholarship Facilities

At our General Meeting in December last, my predecessor as President referred to the need for taking steps to ensure that the influx into the Schools of Mines and Universities of young men offering themselves for training in such subjects as mining engineering, geology and extractive metallurgy, is maintained at a level sufficient for the anticipated needs of the overseas mining industry.

A Working Party, which was set up to make a comprehensive study of this problem, recommended, amongst other measures, that the scholarship facilities at present offered by the industry should be expanded. This recommendation has been accepted and the Association has decided to establish a Central Scholarship Fund.

A number of the larger companies and groups of companies have already promised generous financial support and a general appeal will shortly be issued to members of the Association inviting them to contribute.

It is important that new entrants into the industry shall be of the best available quality, and I believe that in order to attract young men of the right type and to encourage them to qualify for a university degree, provision should be made in the new scholarship scheme for giving adequate assistance to students who would be debarred under "means tests" from accepting scholarships offered by the State and other sources.

A Committee has been appointed to consider details of the new scheme and it is hoped that an announcement will be made on the subject early in the New Year.

The report for the year ended September 30, 1957, was unanimously adopted.

Mr. Clifford Waite was elected president and Mr. A. V. Conrad vice-president for the ensuing year, and the proceedings terminated with a vote of thanks to the retiring president.

Publications Received

The Proceedings of the Shotfiring Convention, held at the University of Sheffield on January 23 and 24, 1957, have been published by the University of Sheffield, Postgraduate School of Mining, price 7s. 6d.

*

"Energy and Man" is the theme of a special issue of the Esso Magazine, which presents in a single publication the opinions of the highest authorities in their individual spheres on the broad subject of energy. The field covered ranges from coal and hydroelectricity to nuclear power and solar energy.

*

Bulletin No. 31, *Assaying of Radioactive Rocks and Ores*, has been issued by the Commonwealth of Australia, Department of National Development Bureau of Mineral Resources, Geology and Geophysics. The information presented is based on experience gained by the Bureau in certain types of radioactive measurements. The authors are J. Daly, D. F. Urquhart and M. R. Gibson.

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Add Sundry Revenue *less* Expenses	6,225	
	387,169	
Taxation	114,046	
Profit after Taxation	273,123	
Balance of Income and Expenditure Account at 31st August, 1956	306,538	
		£579,661
Expenditure on Mining Assets and Trade Investments	59,078	
Dividends declared :—No. **101** of **3s. 6d.** per share and No. **102** of **4s. 0d.** per share	144,375	
		203,453
Balance of Income and Expenditure Account at 31st August, 1957		£376,208

The coal despatched from the mine amounted to **1,693,067** tons, a decrease of **53,888** tons compared with the total for the previous year. This decrease was due to a lower output in the Wolvekrans Section owing to the shortage of non-European labour which persisted during the year.

The modernisation of the underground transport system was commenced during the year and good progress has been made.

It is estimated that capital expenditure for the financial year ending the 31st August, 1958, will amount to **£200,000**, of which approximately **£150,000** will be incurred on the completion of the new underground conveyor system, and **£50,000** mainly on an additional coal crusher, a senior staff house and equipment for the clarification of washing plant water.

The full Report and Accounts may be obtained from the London Secretaries, A. MOIR & CO., 4, London Wall Buildings, London, E.C.2.

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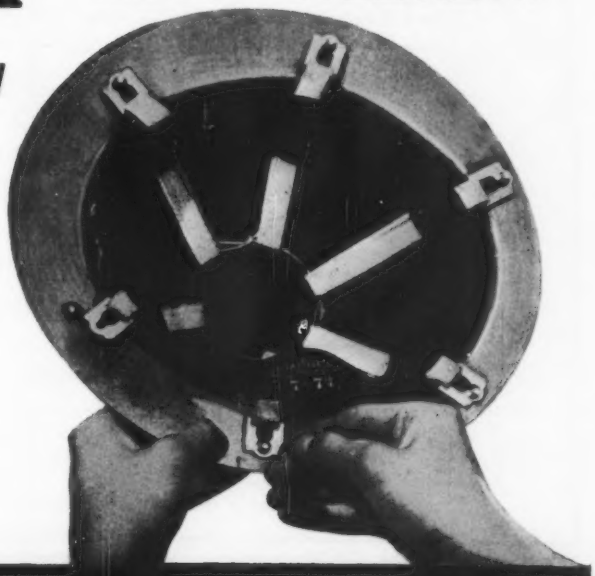

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Arsenic, £400 per ton
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Cadmium 11s. 3d. lb.
Cerium (99% net), £13 18s. lb. delivered U.K.
Chromium, Cr. 99% 7s. 2d. lb.
Cobalt, 16s. lb.
Germanium, 99.99%, Ge. kilo lots 3s. 4d. per gram
Gold, 249s. 2½d.
Iridium, £27/29 oz. nom.
Lanthanum (98/99%) 15s. per gram.
Manganese Metal (96%-98%) £310
Magnesium, 2s. 5½d. lb.
Nickel, 99.5% (home trade) £600 per ton
Osmium, £20/22 oz. nom.
Osmiridium, nom.
Palladium, £7 10s./£8 0s. oz.
Platinum U.K. and Empire Refined £28/10 oz.
Imported £27/£27 10s. nom.
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Amblygonite basis 7% Li_2O	£26 5s. per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./£30 0s. d/d
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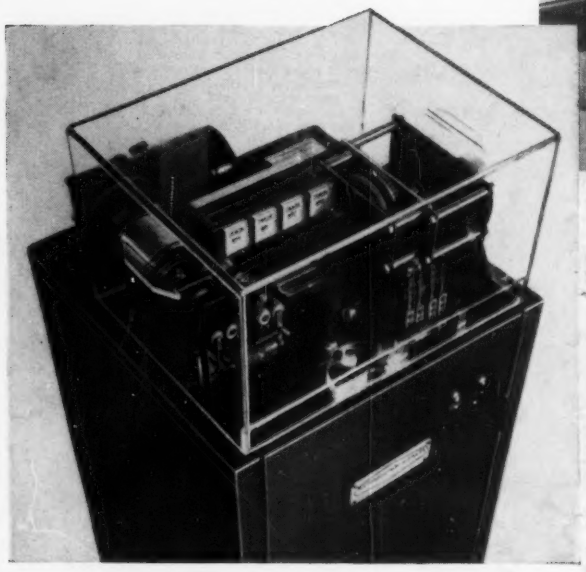

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